START

0029734

Sta #10

JUL 22 1993

ENGINEERING DATA TRANSMITTAL

1. EDT 142535

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	200/300 Area Remedial Investigations	n/a
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
200-BP-1/ER W-263	M. A. Buckmaster	n/a
8. Originator Remarks:		**9. Equip./Component No.:**
Approval		n/a
		10. System/Bldg./Facility:
		n/a
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:**
n/a *H-2-817493 sh 2 was released 7-22-93. It was not microfilmed before it was sent to duplicating, in the process of making copies the machine destroyed the drawing. A replacement copy was made, resigned 7-26-93. The release stamp was dated 7-27-93. RM Ammann RMA		n/a
		13. Permit/Permit Application No.:
		n/a
		14. Required Response Date:
		n/a

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	W-263-C1		0	Construction Specifications for Prototype Surface Barrier at 200-BP-1 Operable Unit Sitework Construction Services	3Q	1	1	
2	W-263-C2		0	Construction Specifications for Prototype Surface Barrier at 200-BP-1 Operable Unit	3Q	1	1	
3	H-2-817484	1	0	Drawing List	3Q	1	1	
4	H-2-817485	1	0	Civil Site Plan Prep Plan	3Q	1	1	
5	H-2-817486	1	0	Civil Profile Raw Water	3Q	1	1	
6	H-2-817487	1	0	Civil Profile & Details Raw Water	3Q	1	1	

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng. M. A. Buckmaster		7/19/93							
1	1	Cog. Mgr. R. A. Carlson		7/19/93							
1	1	QA R. L. Hand		7/19/93							
		Safety n/a									
		Env. n/a									

AUG 1993 RECEIVED EDMC

18. M. A. Buckmaster — Signature of EDT Originator — Date 7/19/93

19. n/a — Authorized Representative for Receiving Organization — Date

20. R. A. Carlson — Cognizant/Project Engineer's Manager — Date 7/19/93

21. DOE APPROVAL (if required)
Ltr. No.
☐ Approved
☐ Approved w/comments
☐ Disapproved w/comments

ENGINEERING DATA TRANSMITTAL
(CONTINUATION PAGE)

5. Proj./Prog./Dept./Div.:	6. Cog. Eng.	1. EDT	
W-263- 200-BP-1/ER	M. A. Buckmaster	142535	Page 2 of 2

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/ Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Transmittal	Originator Disposition	Receiver Disposition
7	H-2-817488	1/2	0	Civil Plan, Section & Detail Water Collection System	3Q	1	1	
8	H-2-817488	2/2	0	Civil Plan, Section & Detail Water Volume System	3Q	1	1	
9	H-2-817489	1/2	0	Civil Plan, Section & Detail Asphaltic Layer	3Q	1	1	
10	H-2-817489	2/2	0	Civil Plan, Section & Detail Asphalt Layer Drainage	3Q	1	1	
11	H-2-817490	1	0	Civil Plan, Drainage & Basalt Layers	3Q	1	1	
12	H-2-817491	1	0	Civil Plan, Filter & Clean Fill Layers	3Q	1	1	
13	H-2-817492	1	0	Civil Plans Lower & Upper Silt Layers	3Q	1	1	
14	H-2-817493	1/2	0	Civil Final Plan Roads, Barricades, Signs	3Q	1	1	
* 15	H-2-817493	2/2	0	Civil Final Plan Roads, Barricades, Signs	3Q	1	1	
16	H-2-817494	1	0	Civil Sections & Details Barrier Cross Section	3Q	1	1	
17	H-2-817495	1	0	Civil Plan & Details Asphalt Test Pad, Lysimeter	3Q	1	1	
18	H-2-817496	1	0	Civil Details Road, Signs & Access Tubes	3Q	1	1	

9413155.1552

W-263-C1
Revision 0

CONSTRUCTION SPECIFICATION

PROTOTYPE SURFACE BARRIER AT 200-BP-1 OPERABLE UNIT SITEWORK CONSTRUCTION SERVICES

OFFICIAL RELEASE BY WHC
DATE JUL 22 1993
Sta #10 EDT-142535

Work Order ER3412

Prepared By:
Kaiser Engineers Hanford Company
Richland, Washington

For the US Department of Energy
Contract DE-AC06-87RL10900

APPROVED

Kaiser Engineers Hanford Company (KEH)

David Lyle Fort Design Engineering	6/16/93 Date	Robert B Hoffmann Technical Documents	6-16-93 Date
D Lundgren Safety	6-17-93 Date	Sheryl D. Consort Environmental Engineering	6/16/93 Date
B.R. Fellion Quality Engineering	6-18-93 Date	[signature] Construction	7-16-93 Date
R.D. Hathaway Project Management	7/16/93 Date		

Westinghouse Hanford Company (WHC)

Mark A. Burks — 7/19/93
~~Projects Department~~ Date

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED PROFESSIONAL ENGINEER
David Lyle Fort 7/16/93
EXPIRES 10/11/93

RELEASED FOR CONSTRUCTION

— N/A — —
US Department of Energy Date

TABLE OF CONTENTS

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 INTRODUCTION

1.1.1 Project W-263 provides for construction of a prototype surface barrier over the 216-B-57 crib located on the 200 Area plateau inside the 200-BP-1 Operable Unit on the Hanford Site, approximately 40 kilometers (25 road miles) northwest of Richland, Washington.

1.1.2 This Specification is for the preparation of the site for the prototype, the excavation of a disposal basin, and the extension of a raw water pipeline.

1.2 STATEMENT OF WORK

1.2.1 Scope: Work consists of furnishing labor, equipment, and materials for preparing the site, excavating the disposal basin, and extending the pipeline in accordance with the Contract Documents.

1.2.2 Work Included: Following itemization is intended to be broad in scope to identify major work elements and is not all inclusive.

1.2.2.1 Install raw water pipeline with hydrant and garden hose bib.

1.2.2.2 Relocate security fence of adjacent tank farm.

1.2.2.3 Clear, grub and place fill on project site.

1.2.2.4 Excavate water disposal basin.

1.2.2.5 Abandon wells in crib and around crib as indicated on Drawings.

1.2.2.6 Install permanent survey monuments.

1.2.3 Work Not Included: Following work elements are part of the Project, are covered by documents noted, and will be done by others.

1.2.3.1 Items shown on the Drawings H-2-817488 through H-2-817496 and described in specification W-263-C2.

1.3 DRAWINGS

1.3.1 Drawings and Specifications which show work to be accomplished by the Contract Documents are listed on Drawing H-2-817484.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 The following documents, including others referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 653-90	Standard Terminology Relating to Soil, Rock, and Contained Fluids

1.1.1.2 Hanford Plant Standards (HPS)

556-AC	Standard Specification for Steel Chain Link Security Fence

1.1.1.3 Kaiser Engineers Hanford (KEH)

KAP 7.4	Submittal Process
IS 100	Excavation, Trenching, and Shoring

1.1.1.4 Washington Administrative Code (WAC)

Title 296	Labor and Industries
Chapter 296-155	Safety Standards for Construction Work
Title 173	Ecology, Department of
Chapter 173-160	Minimum Standards for Construction and Maintenance of Wells

1.1.1.5 Washington State Department of Transportation (WSDOT)

M41-10-91	Standard Specifications for Road, Bridge, and Municipal Construction

1.2 SUBMITTALS

1.2.1 See KEH KAP 7.4 for submittal procedures.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General: Obtain specified soils from excavation or other designated locations. Obtain onsite approval for soils.

2.1.2 Fill or Backfill

2.1.2.1 Structural: Well graded soil mixtures which may contain cobbles up to 75 mm (3 inches) in greatest dimension if uniformly distributed and not constituting more than 20% of volume of fill.

2.1.2.2 Common: Well graded soil mixtures containing cobbles up to 200 mm (8 inches) in greatest dimension if uniformly distributed and not constituting more than 40 percent of volume of fill.

2.1.3 Bedding for Underground Piping: Sand, defined in ASTM D 653, or excavated sandy material having less than 20% gravel particles and maximum dimension of 13 mm (½ inch).

2.1.4 Plastic Sheet Marker: 150 mm (6-inch) wide detectable tape imprinted with a warning, such as "Caution - Buried Installation Below," at intervals of 1.2 meters (4 feet) maximum; Reef Industries, Inc., "Terra Tape D."

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

3.1.1 The Contractor shall clear and grub those areas as indicated on the Drawings.

3.1.2 Clearing means removal and disposing of all unwanted material from the surface such as trees, brush, or other natural material.

3.1.3 Grubbing means removal and disposal of all unwanted vegetative matter from underground, such as sod stumps, roots or other debris.

3.2 EXCAVATION

3.2.1 Obtain an excavation permit before performing excavation.

3.2.2 Locate and expose underground utilities by hand tools. Use of heavy equipment and machinery is subject to approval of Construction Engineer.

3.2.3 Slope sides of excavations or trenches more than 1.2 meters deep in accordance with Procedure KEH IS 100.

3.2.4 Do not store excavated or other material closer than 0.6 meters from edge of excavation unless a barrier is erected to retain excavated materials. Store and maintain materials in manner that they are prevented from falling or sliding into the excavation.

3.2.5 Wherever slopes of excavations will intersect existing underground lines or structures such as building foundations, underground piping, electrical ducts or direct buried electrical lines, install shoring or other means of support to prevent overstressing existing structure or undergound lines or to prevent interrupting service to existing buildings.

3.2.6 Trenches for Underground Piping

3.2.6.1 Make excavations to line and grade shown on the Drawings and wide enough to make connections. Excavate with near vertical sides from bottom of trench up to 0.3 meters above utility lines. Excavate trench deep enough to permit placement of compacted sand bedding, 100 mm minimum thickness, beneath lines except where excavation is in undisturbed sand which will serve as bedding or where lines are to be encased in concrete. Pare holes in trench bottoms for pipe couplings so pipe will bear full length of barrel or section.

3.2.6.2 Install shoring to hold materials and surcharge pressure for full depth of trench.

3.2.6.3 Keep trenches free of standing water when laying is in progress.

3.2.6.4 If over-excavation occurs, correct by placement of structural backfill.

3.2.7 Soils in Contaminated Zones

3.2.7.1 Salvage stabilization material that was in situ and reuse after backfilling and compacting. Do not use backfill that is contaminated. See subparagraph 3.3.1.5.

3.2.7.2 Conduct density tests on soils in situ, using nuclear density gage, during excavation. Results of tests shall be used for testing compaction of backfill.

3.2.7.3 Contact the construction engineer for disposal requirements.

3.3 INSTALLATION

3.3.1 Fill and Backfill

3.3.1.1 General

a. Backfill Permit: Obtain signatures required on the backfill permit for each element to be filled or backfilled. Work not started within 5 calendar days from the time a permit is approved shall not be started until a new permit is approved. A continuing job that has not had backfill installed within the past 5 calendar days will require a new backfill permit.

b. Remove debris and organic matter from area to be filled or backfilled.

c. Use only specified materials for fill or backfill. Keep materials free of frozen particles, lumps, organic matter, and trash.

d. Do not place fill or backfill on frozen ground.

e. Filling or backfilling by sluicing or flooding with water will not be permitted.

f. Bring fill or backfill up evenly on sides of walls, structures, and utility lines to avoid unbalanced loading.

3.3.1.2 Structural

a. Before placement of fill or backfill, demonstrate by physical test at the worksite, that proposed layer depths and procedure for compaction of soils will provide the degree of compaction specified. Prepare "Soil Compaction Procedure" Form KEH-382, in accordance with the instructions.

b. Place backfill in accordance with WSDOT M41-10, Section 2-03.3(14)C and approved procedure as follows.

1) Use Method C under foundations, slabs, and pipelines.

2) Use Method B under pavements and roads, and within 1.5 meters of buildings, fences, and other structures, or poles supporting electric lines or pipe.

c. Compaction control tests will be in accordance with WSDOT M41-10, Section 2-03.3(14)D.

3.3.1.3 Common:

a. Place fill or backfill in layers not more than 300 mm thick, loose measurement.

b. Compact each layer, full width, by at least 1 pass of vibratory or rammer type compactor, pneumatic-tired roller, loaded scraper wheel, grader wheel, or power roller.

c. Mound over top layer of backfill to depth of 25 mm for each 300 mm of trench depth to maximum mound height of 150 mm.

3.3.1.4 Underground piping:

a. Bedding placed beneath utility lines in trenches shall be material meeting the requirements of Paragraph 2.1.3.

b. Place and compact bedding in trench prepared according to subparagraph 3.2.6.1 before laying utility lines. Compact bedding as specified for structural backfill.

c. Place backfill over joints in underground pipes only after pressure testing of line has been completed.

d. Backfill under conduit, pipe, and haunches of pipe; around sides; and 1 foot minimum above top of pipe or conduit with bedding material. Place and compact material same as specified for structural backfill. Compact uniformly on both sides of pipe to avoid misalignment of pipe and provide uniform bearing along barrel of pipe.

e. Backfill utility trenches from elevation 0.3 meters above top as follows.

1) For locations specified in subparagraph 3.3.1.2, use structural backfill.

2) Use common backfill in accordance with subparagraph 3.3.1.3 for other locations.

f. Do not allow heavy construction equipment to pass over buried lines until at least 0.6 meters of backfill has been placed over line or until bridging has been placed across trenching and approved by Construction Engineer.

3.3.1.5 Soils in contaminated zones:

a. Compact backfill by depositing soils in 200 mm thick layers and compacting to density equal to in situ density determined by tests made during excavation. Maintain uniformity of compaction throughout backfill.

b. Do not use soils containing rocks larger than 75 mm (3 inches) in greatest dimension for compacted backfill.

c. Do not use contaminated soils as backfill.

3.3.2 Plastic Sheet Marker Tape: Place continuously and directly over buried utility lines, 0.3 meters below finished grade.

3.3.3 Abandon remaining monitoring wells in 216-B-57 crib in accordance with WAC-173-160. See Drawing H-2-817485.

3.3.4 Relocate security fence in accordance with HPS-556-AC.

3.3.5 Excavate water disposal basin. Dispose of excavated material in the area shown. See Drawing H-2-817493.

END OF SECTION

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SECTION 02650

PIPED UTILITIES

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 The following documents, including others referenced therein, form part of this Section to the extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 2241-89	Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
D 2466-90a	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
D 2672-89	Joints for IPS PVC Pipe Using Solvent Cement

1.1.1.2 American Water Works Association (AWWA)

C500-86	Gate Valves for Water and Sewerage Systems

1.1.1.3 International Association of Plumbing and Mechanical Officials (IAPMO)

UPC	Uniform Plumbing Code, 1988

1.1.1.4 Kaiser Engineers Hanford (KEH)

KAP 4.1	Material/Equipment Requisitioning
KAP 7.4	Submittal Process
KAP 17.1	Project Records Management
RD 1	Receiving and Inspection of Material

1.1.1.5 National Fire Protection Association (NFPA)

24	Installation of Private Fire Service Mains and Their Appurtenances, 1992 Edition

1.1.1.6 Washington state Department of Transportation (WSDOT)

M41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS

1.2.1 See KEH KAP 7.4 for submittal procedures.

1.3 QUALITY ASSURANCE

1.3.1 Product Acceptability: Prevent incorporation of misrepresented products into the work, in accordance with KEH KAP 4.1.

1.3.2 Deliverable Documentation: The following documents and records, required by this Section, shall be delivered to Construction Document Control in accordance with KEH KAP 17.1.

Document	Paragraph
Leak/Pressure Test Certification	3.2.1.2

1.4 DELIVERY, STORAGE, AND HANDLING

1.4.1 See KEH RD 1 for general requirements.

PART 2 - PRODUCTS

2.1 SUBSTITUTES

2.1.1 See KEH KAP 4.1 for substitution approvals.

2.2 MATERIALS

2.2.1 Pipe and Fittings

2.2.1.1 Piping and fittings shall meet the requirements of Pipe Codes in this Section, and details on the Drawings.

2.2.1.2 Tapping sleeve for ductile iron pipe: Meeting the requirements of WSDOT M41-10, 9-30.3(8). Mueller Co. No. H-615.

2.2.2 Valve Boxes for Raw Water System: Meeting the requirements of WSDOT M41-10, 9-30.3(4). Mueller Co. No. H-1303-1.

2.2.3 Hydrant: Model having compression type main valve that opens against pressure. Inlet shall be 4 inches in diameter with a 4 inch minimum valve opening. Hydrant shall have two 2-1/2 inch hose nozzles (no 6 inch nozzle), including caps and chains. Nozzle threads shall be in accordance with NFPA Standard. Hydrant operating nut and cap shall be National Standard Pentagon and open in a counter clockwise direction. Stem seals shall be O-ring type. Model A-400 by Mueller Co.

2.2.4 Garden Hose Outlet: See Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 General

3.1.1.1 Install piping and piping accessories in accordance with the UPC, the Pipe Codes, the Drawings, and this Section.

3.1.1.2 Keep piping systems clean during installation. Once construction has started on length of pipe, plug or cap open ends when installation is not in progress to prevent entry of dirt and other foreign material.

3.1.1.3 Where piping is laid in trench, trench shall be free of frost or frozen earth and standing water.

3.1.2 Flushing

3.1.2.1 Obtain written method for disposal of flushing water from Operating Contractor.

3.1.2.2 After installation and before pressure testing completed system, flush piping with water until effluent is clean and contains no visible particulate matter but in no case for less than one minute.

3.1.2.3 Perform leak/pressure testing in accordance with Paragraph 3.2.1.

3.2 FIELD QUALITY CONTROL

3.2.1 Hydrostatic Testing

3.2.1.1 Furnish instruments, facilities and labor required to conduct tests.

3.2.1.2 Document leak/pressure testing of each piping system on "Leak/Pressure Test Certification" Form KEH-1757.

3.2.1.3 Perform tests after lines have been flushed and before backfilling or application of exterior protective coating.

3.2.1.4 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

3.2.1.5 Install a temporary pressure relief valve during testing of each system. The relief valve shall have a discharge capacity of 125% minimum of pressurizing device capacity and be set to operate at 110% maximum of test pressure.

3.2.1.6 Verify air has been expelled from piping before applying hydrostatic pressure.

3.2.1.7 Test new piping for 30 minutes minimum, with no visible leaks or loss of test pressure. Examine joints, fittings, and other potential leak sources during testing. Repair detectable leaks, re-examine by same test method originally prescribed and retest.

3.2.1.8 If lines are subject to freezing, remove water upon completion of hydrostatic test.

3.2.1.9 Use test pressures shown on the Pipe Codes.

PIPE CODE A			
Service	Max Operating Pressure	Test Pressure	Max Operating Temp
Raw Water	827 kPa (120 psig)	1240 kPa (180 psig)	38°C (100° F)
Sizes	75 mm (3") and larger		
Pipe	Polyvinyl Chloride (PVC) in accordance with ASTM D 2241 SDR 21 or lower.		
Joints	Solvent cement in accordance with ASTM D 2672.		
Wall Thickness	SDR 21 or lower, or Schedule 40.		
Fittings	Socket type, Schedule 40 in accordance with ASTM D 2466.		
Valves	Gate valves, conforming to AWWA C500, with 50 mm (2-inch) operating nut.		

KAISER ENGINEERS HANFORD	LEAK/PRESSURE TEST CERTIFICATION	Report No.	Page 1 of 2

Project or W.O. No.	Title	Dwg. Reference	Test Procedure/Rev.

Construction Spec./Rev.	Code or Standard	Year	Addenda	Class	Stamp Required ☐ Yes ☐ No

Description of System or Component(s) Test Boundaries

____

____

TEST PREPARATION

Notification Requirements	Valve Line-up Requirements (for permanent valves installed)		
☐ Quality Control	Valve I.D. ______	☐ Open	☐ Close
☐ Acceptance Inspection	Valve I.D. ______	☐ Open	☐ Close
☐ Safety Engineer	Valve I.D. ______	☐ Open	☐ Close
☐ Client ______	Valve I.D. ______	☐ Open	☐ Close
☐ Authorized Inspector	Valve I.D. ______	☐ Open	☐ Close
☐ ______	Valve I.D. ______	☐ Open	☐ Close

Required Test Medium	Required Test Medium Temp.	Flushing Requirements	
Medium ______	Temp. ______	Flushing ______	☐ Blue Chalking Required ☐ Soap Solution Required

Design System Pressure ______	Design Test Pressure ______	Specified Hold Time ______	Prepared By	Date

PRETEST CHECKLIST

Item or Requirement	Craft Supervision	Quality Control Accept	Quality Control Date
Valve line-up per design requirements (see above line up).			
Flushing of system and/or component completed per design requirements.			
All lines or components not to be tested are properly isolated or disconnected.			
Vents and openings checked; proper Pressure Relief Valve installed and discharge checked.			
Test medium per design requirements; temperature equalized. Medium ______ Medium Temp. ______ (ASME only)			
Test gauge(s) correct range and currently calibrated. SN ______ Range ______ Cal. Due Date ______ SN ______ Range ______ Cal. Due Date ______ SN ______ Range ______ Cal. Due Date ______			
Pressure Relief Valve properly set and currently calibrated. SN ______ PSI Set ______ Checked Date ______ SN ______ PSI Set ______ Checked Date ______ SN ______ PSI Set ______ Checked Date ______			

KEH-1757.01 (2/88)

9113155.1567

W-263-C2
Revision 0

CONSTRUCTION SPECIFICATION FOR

PROTOTYPE SURFACE BARRIER AT 200-BP-1 OPERABLE UNIT

Work Order ER3412

Prepared By:

Kaiser Engineers Hanford Company
Richland, Washington

For the U.S. Department of Energy

Contract DE-AC06-87RL10900

APPROVED
Kaiser Engineers Hanford Company (KEH)

David Lyle Fort	6/16/93	Robert B Hoffmann	6-16-93
Design Engineering	Date	Technical Documents	Date
D Lundgren	6-17-93	Sheryl D. Consort	6/16/93
Safety	Date	Environmental Engineering	Date
R.R. Fillion	6.18.93	[signature]	7-16-93
Quality Engineering	Date	Construction	Date
R. A. Matthews	7/16/93		
Project Management	Date		

Westinghouse Hanford Company

Mark A. Bates	7/19/93
~~Projects Department~~	Date

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER

David Lyle Fort 7/16/93

EXPIRES 10/11/93

KAISER ENGINEERS HANFORD	LEAK/PRESSURE TEST CERTIFICATION	Report No.	Page 2 of 2

TEST PERFORMANCE

Item or Requirement	Quality Control: Accept	Quality Control: Date
RDT/NE and other if specified:		
50% Tp obtained and examination conducted = Tp _____		
Pressure increments at 0.10 Tp: = Tp _____		
= Tp _____		
= Tp _____		
= Tp _____		
= Tp _____		
Hydrostatic testing - areas to be inspected chalked prior to application of pressure.		
Hydrostatic testing - examination conducted while system/components pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.		
Pneumatic Testing - soap solution applied to areas to be tested and system/components examined while pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.		

Pressure Test ☐ Accepted ☐ Rejected	Quality Control Signature	Stamp or PR No.	Date

INSPECTION VERIFICATION

Documentation properly prepared. ☐ Yes ☐ No		Actual Tp during final inspection _____ PSI	
All joints and welded attachments to pressure retaining components chalked/hoaped as applicable. ☐ Yes ☐ No			
All joints and welded attachments to pressure retaining components visually inspected for leakage. ☐ Yes ☐ No		Specified hold time verified at _____ a.m. p.m.	
Pressure Test ☐ Accepted ☐ Rejected	Acceptance Inspection Signature	Stamp or PR No.	Date

OTHER

Comments

NCR No. (if applicable)	Client Representative		Date
	Witness - ASME Authorized Inspector		Date
☐ Document Reviewed ☐ Drawings Highlighted	Construction Engineering	PR No.	Date

* GPO 1988—784-843

KEH-1757.02 (2/88)

END OF SECTION

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SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 INTRODUCTION

1.1.1 Project W-263 for construction of a prototype surface barrier over the 216-B-57 crib is located on the 200 Area plateau inside the 200-BP-1 Operable Unit on the Hanford Site, approximately 40 kilometers (25 road miles) northwest of Richland, Washington.

1.1.2 This Specification is for the construction of the prototype.

1.1.3 Experience Qualifications: See Section 02200.

1.2 STATEMENT OF WORK

1.2.1 Scope: Work consists of furnishing labor, equipment, and materials for constructing the prototype in accordance with the Contract Documents.

1.2.2 Work Included: Following itemization is intended to be broad in scope to identify major work elements and is not all inclusive.

1.2.2.1 Place sandy soil fill.

1.2.2.2 Furnish and install lower neutron probe access tubes in fill.

1.2.2.3 Construct pan lysimeters (barrier and test pad).

1.2.2.4 Place asphaltic concrete for barrier and test pad.

1.2.2.5 Install water collection, volumes and discharge system.

1.2.2.6 Place drainage gravel layer.

1.2.2.7 Develop basalt mining operation.

1.2.2.8 Place fractured basalt layer and side slope.

1.2.2.9 Place and compact crushed rock gravel filter over inside surfaces of the basalt and exposed drainage gravel surfaces.

1.2.2.10 Excavate soil/gravel from selected borrow area.

1.2.2.11 Place clean fill side slope.

1.2.2.12 Excavate sand from selected borrow area. Process as required to maintain gradation criteria.

1.2.2.13 Place and compact sand filter over inside surfaces of barrier.

1.2.2.14 Place geotextile separator/cushion over sand filter.

1.2.2.15 Develop and excavate silt borrow area.

1.2.2.16 Place lower silt layer.

1.2.2.17 Install neutron probe access tubes in silt.

1.2.2.18 Loosen lower silt layer.

1.2.2.19 Process pea gravel and silt using pug-mill.

1.2.2.20 Place silt admix.

1.2.2.21 Place and compact perimeter crushed basalt base course.

1.2.2.22 Loosen admixed silt layer.

1.2.2.23 Construct access road and parking area.

1.2.2.24 Place signs and chain barricade.

1.2.2.25 Decommission basalt mining operation.

1.2.2.26 Decommission silt borrow area. Stabilize and seed impacted areas.

1.2.3 Work Not Included: Following work elements are part of Project and are covered by other documents noted and will be done previous to, concurrently with, or after work included in the Contract Documents.

1.2.3.1 Items shown on the Drawings to be done by others.

1.2.3.2 Extension of raw water pipeline and installation of hydrants.

1.2.3.3 Site preparation (clearing and grubbing).

1.2.3.4 Installation of survey monuments.

1.2.3.5 Stabilizating or vegetating the barrier surface.

1.2.3.6 Excavation of water disposal basin.

1.3 DRAWINGS

1.3.1 Drawings which show work to be accomplished by the Contract Documents are listed on Drawing H-2-817484.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01019

ITEMS FURNISHED FOR CONSTRUCTION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Code of Federal Regulations (CFR)

Title 30	Mineral Resources
Part 56	Safety and Health Standards--Surface Metal Nonmetal Mines

1.2 SUBMITTALS: Not Used

1.3 GENERAL

1.3.1 Material and equipment furnished or made available for incorporation into the Work are identified in this Section. Other services and utilities provided are covered in other sections of this Specification.

1.3.2 Meet the provisions of Section 9 of the Contract General Conditions for items furnished for construction.

1.3.3 Provide KEH access to premises where items furnished for construction are stored before incorporation into the Work.

1.4 GRAVEL, SAND, SILT, AND BASALT

1.4.1 Haul Distances: See Drawing H-2-817484 for locations of borrow sites.

1.4.1.1 Unmined natural deposits of gravel are available at an existing gravel pit within 3 miles southeast.

1.4.1.2 Deposits of sand are available at an existing spoil pile within 9 miles east.

1.4.1.3 Unmined natural deposits of silt are available at McGee Ranch within 10 miles west.

1.4.1.4 Unmined natural deposits of basalt are available alongside Washington State Highway 240 within 12 miles northwest.

1.4.2 If Contractor elects to utilize available borrow sites he shall furnish equipment and labor required to excavate, process, load, transport, and place material.

1.4.3 Material shall be used only for the Work covered by this Specification and no gravel, sand, silt, or basalt processed or unprocessed, or concrete manufactured therefrom shall be transported off the Hanford Site.

1.4.4 Access to borrow sites and travel between borrow sites and construction sites shall be on roads designated by KEH and use shall be in accordance with Section 01500.

1.4.5 Operations of borrow sites shall meet the following requirements.

1.4.5.1 Confine clearing, grubbing, and removal of overburden and top soil to areas designated by KEH. Stabilize blow sand areas after surface has been disturbed, with ballast or other approved method to prevent wind erosion.

1.4.5.2 Make no excavation or bank cut within 100 feet of power lines, paved roads, railroads, security fences, or other permanent structures.

1.4.5.3 Excavating and processing shall be in accordance with 30CFR56. Correct operations identified by KEH to be hazardous to life or property.

1.4.5.4 Explosives are prohibited articles described in Section 56 of the Contract General Conditions and shall not be brought to the Hanford Site or proposed for use without written KEH approval.

1.4.5.5 Temporary structures are permitted at borrow sites for offices, storage, or repair facilities necessary for material removal and processing. No facility for habitation will be permitted.

1.4.5.6 Use of borrow sites are nonexclusive. Others may also enter to excavate material required for other work.

1.4.5.7 Upon completion of operations clear borrow sites of debris, temporary structures, and equipment. Grade excavated area, properly slope banks, and stabilize to prevent wind erosion. Conditions identified by KEH as not meeting these requirements shall be corrected before final acceptance of the Work.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01027

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 FORMAT

1.3.1 Complete Form KEH-1026, Progress Estimate Backup, sample included. Contractor developed substitute for form may be used with prior approval of KEH.

1.3.2 Complete Form KEH-0959, Monthly Estimate of Work Completed, sample included, or include following in letter requesting payment.

Subtotal Value of All Pay Items Completed to date (Include modifications)		$X,XXX.XX
Allowance for Material Stored on Site:		
Previous Net Allowance	$X,XXX.XX	
Minus Materials Placed	$X,XXX.XX	
Plus Materials Stored	$X,XXX.XX	
Net Allowance		$X,XXX.XX
Subtotal Value Completed to Date		$X,XXX.XX
Less Previous Payments	$X,XXX.XX	
Less Other Charges from KEH	$X,XXX.XX	
Subtotal Deductions		$X,XXX.XX
Total Payment Requested		$X,XXX.XX
Less Retainage at ___%		$X,XXX.XX
Total Payment Allowed		$X,XXX.XX

1.4 APPLICATION PROCEDURE

1.4.1 Payments to Contractor specified in Section 15 of Contract General Conditions are initiated by Contractor making application as follows.

1.4.1.1 Begin application by completing Form KEH-1026. For lump sum contracts, each application shall include, as minimum, breakdown of Contract price for items listed in Section 01310 and percent complete for each item.

1.4.1.2 Review backup sheets with KEH approximately 5 days before end of pay period and adjust data if required by KEH.

1.4.1.3 Finalize application by meeting requirements of Paragraph 1.3.2.

1.5 PAYMENT PROCEDURE

1.5.1 Upon receipt of application, KEH will audit data and check for compliance with requirements of Section 01720. When satisfied that Contract requirements are up-to-date, Form KEH-0959 will be signed by KEH.

1.5.2 Copy of signed Form KEH-0959 showing amount of payment to be made will be furnished to Contractor.

1.5.3 KEH will mail check to Contractor's designated address.

1.6 ADDITIONAL DATA REQUIRED

1.6.1 When processing applications for payment and preparing payment documents, KEH may require data to substantiate and justify amounts requested. Processing of payment documents may be delayed if data is not forwarded expeditiously to KEH.

1.6.2 Requests for payment for equipment or material which Contractor has received, but has not installed, shall be accompanied by invoice or other data to provide evidence that title to equipment or material is held by Contractor.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

KAISER ENGINEERS
HANFORD

PROGRESS ESTIMATE BACKUP

Sheet____ of____

Contractor:	Contract No.:
Subject:	
Backup For Progress Estimate No.:	Dated:

Item	Description	Estimated Cost	Weighted Percent	Percent Complete to Date	W'T'D % Complete to Date	Total $ to Date

SAMPLE

KEH-1026.00 (03-87)

KAISER ENGINEERS HANFORD	MONTHLY ESTIMATE OF WORK COMPLETED	
Contract or P.O. No	Estimate No.	Date
Name of Contractor		
Address		
Nature of Work		

Initial Amount of Contract	Total Amount of Modifications to Date	Total Adjusted Contract Amount
$	$	$

Description			Amount	
Estimated Work Completed to (Date)				
Less: Previous Payments	$			
Other Charges (Explain Below)	$			
Total Deductions			($	)
Adjusted Payment Requested			$	
Less Retainage @ _____%			$	
Total Payment Allowed			$	

SAMPLE

I certify that I have verified this periodical estimate dated _____ for $ _____ and that to the best of my knowledge and belief it is a true and correct statement of work performed and that the contractor's statement of his account and amount due him is correct and just, and the quantities included in this estimate have been performed in full accordance with the terms and conditions of the corresponding construction documents.

FOR THE CONTRACTOR

By _____

KAISER ENGINEERS HANFORD COMPANY

By _____
Project Manager

By _____
Field Contract Engineer

KEH-0959 00 (02/90)

END OF SECTION

SECTION 01040

COORDINATION

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 CONSTRUCTION ACTIVITIES

1.3.1 Coordinate construction activities to ensure efficient and orderly sequence of work, with provisions for accommodating items to be installed later.

1.3.2 As noted in Section 29 of the Contract General Conditions, other contracts may be under construction concurrently with the Work included in this Specification. Coordinate activities with other contractors for mutual benefit. Coordination meetings may be required in addition to progress meetings to keep parties informed of scheduled activities at interface points.

1.3.3 Certain onsite work related to Project will be performed by others. Cooperate and coordinate work to eliminate interferences and delays. Removal of asbestos, mercury, and contaminated soil if encountered will be responsibility of others. Assistance may be required during removal to expedite work and minimize downtime.

1.4 WORK IN EXISTING FACILITIES

1.4.1 Tank farms 241-BX and 241-BY are operating facilities and work shall be planned and scheduled to prevent interference with plant operations and sustain safety of operating personnel. The basalt and silt borrow areas require 24-hour notification prior to entry to allow gates to be opened.

1.4.2 Access to work area will be as directed by KEH to minimize disruptions to work force.

1.4.3 Keep work area safe and orderly for construction and operating personnel. Clean work area after each work period and stack tools and materials away from traffic areas.

1.5 CONNECTIONS TO EXISTING SYSTEMS

1.5.1 Advance notice of work that will affect existing systems shall be given to KEH. Careful planning and scheduling of work is required to coordinate operations of existing systems to keep disruptions at minimum.

1.5.2 As required in subsection 50.8 of the Contract General Conditions, connections to existing systems shall be scheduled 72 hours in advance for work to be done. KEH will coordinate schedule with Contractor and utility.

1.5.3 Connection shall be accomplished within 8 hours during offshift hours.

1.6 ACCESS TO WORK AFTER POSSESSION

1.6.1 Access to warranty work as specified in Section 24 of the Contract General Conditions or access to work after possession as specified in Section 20 of the Contract General Conditions will be coordinated by KEH with other contractors, and users of facility. Notify KEH in advance of proposed work to minimize disruptions.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01043

JOB SITE ADMINISTRATION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American National Standards Institute (ANSI)

Z41-1983	Personnel Protection - Protective Footwear
Z87.1-1989	Practice for Occupational and Educational Eye and Face Protection

1.2 SUBMITTALS: Not Used

1.3 WORKING HOURS

1.3.1 Regular day shift working hours are from 7:30 am to 4:00 pm, Monday through Friday, excluding holidays.

1.3.2 For other than regular day shift work refer to Section 51 of Contract General Conditions.

1.4 BADGE, DOSIMETER, AND ORIENTATION

1.4.1 For work within the Controlled Access Area of Hanford Site, but outside Limited Areas, badge and orientation requirements will be in accordance with Section 56 of Contract General Conditions. Basic dosimeters will not be required.

1.4.2 Badges will not be provided until notice to proceed letter has been signed and returned to KEH, supervisors have attended KEH safety training course, requirements of Section 55 of Contract General Conditions have been received and approved by KEH, and site labor conference and preconstruction meeting specified in Section 01200 have been completed.

1.5 EMERGENCY RESPONSE DRILLS

1.5.1 Personnel working on Hanford Site shall participate in emergency response drills held approximately once each calendar quarter and lasting approximately one hour.

1.5.2 Maintain daily log or other suitable record of personnel, including subcontractors, working on Hanford Site. Provide copies to KEH as requested.

1.6 WORK NEAR OR ON SECURITY FENCE

1.6.1 When effectiveness of fence is disturbed by equipment operating within 10 feet of fence, excavating to depth of 6 inches or more under fence, removal of fence fabric, a site security guard is required to standby. Notify KEH 2 working days before excavating under fence or performing work affecting fence as barrier. Plan work so physical integrity of fence is restored at end of each work day.

1.6.2 Site security guard is furnished by KEH, at no cost, to standby during regular day shift hours. If integrity of fence is not restored, Contractor will be charged $50 per hour for each guard for standby time after regular day shift.

1.7 WORK ON OR NEAR ELECTRICAL LINES OR UTILITY POLES

1.7.1 In addition to requirements of subsection 50.2 of the Contract General Conditions, whenever work is performed under, adjacent to, or on overhead electrical lines or utility poles, notify KEH at least 3 working days before work commences. Notification shall include names and qualifications of personnel performing work, and the methods and equipment that will be used. KEH will coordinate with the Site Utility Organization and notify the Contractor of special safety or operational requirements.

1.7.2 Some work will require that standby lineman be in attendance. Lineman will be furnished by KEH.

1.8 SAFETY REQUIREMENTS

1.8.1 Fire Safety

1.8.1.1 Address fire safety as part of construction safety plan required by Section 55 of the Contract General Conditions. Incorporate following requirements into plan.

a. Utilizing portable shields wherever welding, cutting, or grinding.

b. Maintaining fire watch minimum 1/2 hour after welding, cutting, or grinding.

c. Having fully charged fire extinguisher available whenever welding, cutting, or grinding.

d. Method to prevent ignition of brush fires.

1.8.1.2 See Section 01500 for off-road driving and grass fire prevention requirements.

1.8.2 Safety Apparel

1.8.2.1 Personnel shall not be allowed in construction areas without approved safety apparel. Personnel are required to wear the following in construction areas, and KEH's shops and yards: steel-toed type shoes

meeting the requirements of ANSI Z41; eye protection with eye shield devices meeting the requirements of ANSI Z87.1; hardhats, and clothing that prevents direct exposure to the construction environment. Steel-toed shoes shall be constructed of substantial material, preferably leather. Steel-toed shoes shall be in good condition; damaged footwear, impaired in the performance of it's protective function, is not acceptable. Tennis shoes, canvas type shoes, or other athletic type shoes, including those with steel toe protection, are not acceptable. Tank-top type shirts, sleeveless shirts, dresses or other than full length pants are not allowed. Exceptions to these requirements, for specific work tasks, require advance KEH approval.

1.8.3 Materials Containing Asbestos

1.8.3.1 It is not anticipated that Contractor will encounter materials containing asbestos. However, asbestos which is not readily identifiable may be present in some materials in and around work area. Examples include:

a. Floor tile.

b. Floor tile adhesive.

c. Transite siding.

d. Transite pipe.

e. Roofing shingles/matting.

f. Electrical insulation.

g. Gasket materials.

1.8.3.2 Material suspected of containing asbestos shall not be disturbed. Contact KEH for direction before proceeding with work which would disturb material.

1.8.4 Job safety analysis required in subsection 55.2 of the Contract General Conditions shall address following work items as minimum.

1.9.4.1 Excavations.

1.9.4.2 Hazardous materials.

1.9.4.3 Lockout and tagout procedures.

1.9.4.4 Shoring.

1.9.4.5 Confined spaces.

1.9.4.6 Paint/coatings.

1.9.4.7 Blasting/mining.

1.9.4.8 Pipe installation.

1.9.4.9 Concrete placement.

1.9.4.10 Geotextile installation.

1.9.4.11 Asphalt installation.

1.9.4.12 Stabilization.

1.9.4.13 Placement of sand, gravel, silt, and basalt.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 QUALITY CONTROL

1.3.1 Establishing alignment, support location, and grades shall be the responsibility of a Land Surveyor registered in the State of Washington and acceptable to KEH.

1.3.2 Deliver field notes, records, and documentation to KEH to review and verify procedures used and accuracy of work.

1.4 SURVEY DATA

1.4.1 Basic reference points with coordinate descriptions and bench mark with elevation identified will be located on the Drawings.

1.4.2 Preserve bench marks and reference points, including stakes or other markers established until removal is authorized by KEH.

1.4.3 From information and dimensions shown on the Drawings, perform survey/layout required by the Work.

1.5 PROCEDURES

1.5.1 Before initial layout, field verify horizontal and vertical data. Report discrepancies to KEH before proceeding.

1.5.2 Establish adequate permanent reference points to be used during construction, referenced to original control points. Record locations with horizontal and vertical data on Project record documents.

1.5.3 Protect and preserve control and reference points until Work is complete. Report loss or destruction of control points to KEH. Report relocation or change in data affecting reference points.

1.5.4 Periodically verify data for control and reference points, and construction stakes to maintain construction accuracy.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01065

PERMITS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 FEDERAL, STATE, AND MUNICIPAL LAWS, CODES, AND REGULATIONS

1.3.1 Required permits or licenses to do business are responsibility of Contractor as specified in Section 6 of the Contract General Conditions.

1.4 HANFORD SITE PERMITS

1.4.1 General: Before certain types of work can be done at Hanford, Contractor is required to have a permit. Permits are provided by KEH at no cost, however, furnish information required and notify KEH in advance of work requiring permit. Meet the requirements and restrictions set forth in each permit. Keep permits posted in visible location at site of work being performed.

1.4.2 Excavation Permit: Do not excavate without the permit specified in subsection 50.10 of the Contract General Conditions. Permit will be issued before start of construction and is for duration of the Work. All excavations within 5 feet of known utilities shall be performed by hand digging.

1.4.3 Backfill Permit: Each element of fill and backfill requires a permit. Permits are good for 5 days, or duration of work element provided Work does not stop for 5 consecutive days. Complete permit form, furnished by KEH, and return to KEH for approval before starting work.

1.4.4 Tie-in Permit: Each utility tie-in requires a permit. Permits are valid until tie-in is complete. Permits furnished by KEH with 5 days notice.

1.4.5 Hazardous Work Permit: Start no work without permit. Permit will provide personnel protection requirements and restrictions for work involving welding and cutting, confined spaces, hazardous materials, or other hazardous working conditions. Permit is good for duration of Contract.

1.4.6 Solid Waste Disposal Permit: See Section 01500, Paragraph 1.3.3. This permit is required for disposal of nonhazardous waste on the Hanford Site. Obtain form from KEH, complete, and return to KEH for approval before moving waste to the disposal site.

1.4.7 Oversize Load Permit: In addition to Washington State permit, obtain permits for each movement of each oversize vehicle or load within the Hanford Site. Permits will be furnished by KEH with 48 hour notice of width, height, and length of oversized load and proposed route of travel. Verify proposed route has been traveled and limitations have been identified. See Section 01500 for additional requirements.

1.4.8 Explosives Permit: Obtain permits and approval from appropriate agencies.

PART 2 - <u>PRODUCTS</u>

Not Used

PART 3 - <u>EXECUTION</u>

Not Used

END OF SECTION

SECTION 01100

SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Code of Federal Regulations (CFR)

Title 29	Labor
Part 1910	Occupational Safety and Health Standards

1.1.1.2 Federal Standards (FED STD)

FED-STD-313C	Material Safety Data, Transportation Data, And Disposal Data For Hazardous Materials Furnished To Government Activities

1.1.1.3 Washington Administrative Code (WAC)

Title 173	Department of Ecology
Chapter 173-303	Dangerous Waste Regulations

1.2 SUBMITTALS

1.2.1 See Section 01300 for submittal procedures.

1.2.2 Approval Required

1.2.2.1 Hazardous Material Storage: Five days before delivery, submit a proposed method for storage of hazardous materials.

1.2.2.2 Waste Minimization Plan: Five days before starting work, submit the plan required in Paragraph 1.4.6.

1.2.2.3 Control of Hazardous Energy: Five days before starting work, submit lockout/tagout procedures and training certifications for employees.

1.2.2.4 Contingency Plan: Five days before starting work, submit the contingency plan and emergency procedures required in WAC 173-303-350.

1.2.3 Approval Not Required

1.2.3.1 Hazardous Materials: Five days before delivery, submit a list of hazardous materials to be used. Include their current Material Safety Data Sheets.

1.2.3.2 Hazardous Waste: Five days before starting work, submit physical descriptions and quantities of waste and waste containers to be generated.

1.3 HAZARDOUS MATERIAL REQUIREMENTS

1.3.1 Hazardous products, defined in Section 111 of the Contract General Conditions, whether specified, recommended, or voluntarily requisitioned by Contractor, shall be governed by requirements of FED-STD-313 and Section 111 of the Contract General Conditions.

1.4 DANGEROUS WASTE HANDLING REQUIREMENTS

1.4.1 Dangerous waste, defined in WAC 173-303, generated by Contractor at Project shall be turned over to KEH for disposal.

1.4.2 Contractor designated personnel who handle, transfer, accumulate, or otherwise work with dangerous waste shall be trained by KEH (4 hours per person) and adhere to the requirements of WAC 173-303-330. Other waste management requirements, covered in the KEH training, that shall be followed include:

1.4.2.1 Select compatible waste containers. Container integrity is, in part, dependent upon waste physical and chemical properties.

1.4.2.2 Contractor personnel shall call the KEH Hazardous Waste Coordinator (HWC) to receive container numbers which will be permanently marked on containers for tracking purposes.

1.4.2.3 Contractor personnel shall contact KEH HWC for specific instructions on completing Hazardous Waste labels, and attaching them to containers.

1.4.2.4 Weekly inspections of the satellite accumulation area, by the Contractor's trained waste handler, are required. A report of the inspection on Form KEH-2035 (sample included) shall be forwarded to KEH within 3 working days after the inspection. Forms will be provided by KEH.

1.4.2.5 As waste is accumulated in a container, a Waste Container Log, Form KEH-0844 (sample included) shall be filled out. Forms will be provided by KEH.

1.4.2.6 A full container date shall be recorded when accumulated waste reaches 55 gallons for solids, and 50 gallons for liquids. The container shall be sealed at that time. The Contractor shall notify KEH by forwarding the waste container log within 4 hours after a waste container is full.

1.4.3 Report dangerous waste or hazardous material spills to KEH immediately.

1.4.4 After identification of dangerous waste to be generated, a satellite accumulation area will be designated for Contractor to deposit waste.

1.4.5 Identify and package dangerous wastes as approved or directed by KEH.

1.4.6 Prepare a plan indicating how dangerous waste generated at the project site will be minimized during construction, in accordance with WAC 173-303. Other waste minimization requirements that shall be included are:

1.4.6.1 Material substitution: Replacement of hazardous materials with nonhazardous or less hazardous materials.

1.4.6.2 Inventory reduction: Minimization of chemical inventory on hand, which in turn reduces the undue accumulation of partially used or unused materials requiring disposal upon expiration.

1.4.6.3 Procurement modifications: Minimization of the variety of chemicals used to perform the same or similar processes, and incorporation into procurement specifications of provisions for the return of unused chemical stock and empty, unrinsed containers.

1.4.6.4 Waste segregation: Separation of hazardous and nonhazardous materials to avoid creating additional hazardous waste, and to avoid creating mixtures for which recycling may not be practical.

1.4.6.5 Recycling: Extension of the useful life of materials to delay final disposition as waste.

1.4.6.6 Process modification: Streamlining of processes for more efficient operation and less waste generation.

1.4.6.7 Reuse: Reusing material such as plastic drop cloths, application tools, and rags as much as possible to reduce the volume of waste generated.

1.4.7 Inspections: Provision for KEH inspections of the Contractor's waste management practices and waste minimization efforts.

1.5 CONTROL OF HAZARDOUS ENERGY

1.5.1 Conform to lockout/tagout requirements of 29 CFR 1910.147.

1.5.2 Establish an energy procedure and training plan with provisions for the following.

1.5.2.1 Isolation or inactivation of hazardous energy sources before performing work thereon. A hazardous energy source is defined as a machine or equipment item with the potential for causing injury by unexpected energizing, startup, or stored energy release.

1.5.2.2 Certification of the accomplishment and currency of appropriate training. Certification shall include employee's names and training completion dates.

1.5.3 Coordinate lockout/tagout operations with KEH.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

WEEKLY WASTE STORAGE FACILITY INSPECTION REPORT

Date:	Time:	Location:

	Yes	No	N/A	Corrective Action	Completed	
					Date	Initial
Emergency Equipment (In good condition?)						
Fire Extinguisher						
Spill X Gun						
Chemical Resistant Suit						
Goggles						
Chemical Gloves						
Respirator (up-to-date)						
Boots						
Non-sparking Shovel						
Absorbent						
Eye Wash Station						
Broom						
Barricade Tape						
Housekeeping good?						
Handling equipment in good condition?						
Contingency Plan						
Dangerous Waste Procedure						
Other						

CONTAINER STATUS

Hazardous Waste Container Number	Condition Good?		Labelled - Include Haz. Class		Accumulation Start Date		Current Log Sheet		Corrective Action	Completion	
	Yes	No	Yes	No	Yes	No	Yes	No		Date	Initial

Comments

Print Name: _____ **Signature and Payroll No.** _____

DISTRIBUTION: White & Yellow - Environmental Restoration Pink - Waste Storage Facility KEH-2035.00 (01/91)

WASTE CONTAINER LOG

Barrel Number: _____ Area: _____ Location: _____ Full Container Date: _____
Container Type:

Provide all information requested including MSDS Number and exact waste description including manufacturer, product name, number, color and other applicable information. If MSDS Number is not available include a copy of the MSDS with completed log sheet.

Date	Amount	MSDS Number	Waste Description, Manufacturer, Product Name and Number, Color and other Applicable Information	Name and Pay Number

KEH-0844.00 (10-89)

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Not Used

1.3 PROCEDURES

1.3.1 Representatives from KEH, Contractor, and major subcontractors shall participate in project meetings. Representatives from Operating Contractor and DOE may attend as required by items to be discussed.

1.3.2 Meeting times and locations shall be mutually agreed to by Contractor and KEH and will be held at the Hanford Site in Richland, Washington, except informal design reviews. KEH will issue notices of meetings and prepare meeting minutes which will be distributed to project participants.

1.4 SITE LABOR CONFERENCE

1.4.1 Before starting construction onsite, conduct informational conference on Hanford Site labor requirements applicable to Project. KEH will provide meeting notice to representatives from labor organizations, identified by Contractor, whose members may be utilized in construction and are to attend conference. Contractor shall present proposed work plan and craft utilization, and review Contract General Conditions relating to labor.

1.5 PRECONSTRUCTION

1.5.1 Meeting will be scheduled by KEH before start of onsite work. Authorized representatives of Contractor and major subcontractors shall attend and KEH will advise others having interest in Work. Meeting will be chaired by KEH.

1.5.2 Following items, as minimum, will be incorporated into agenda for meeting.

1.5.2.1 Point of contact and key personnel representing Operating Contractor, Safety, QA/QC, Acceptance Inspectors, and Construction Engineers.

1.5.2.2 Schedule requirements and restraints, submittals and work limitations.

1.5.2.3 Safety, construction progress meetings and frequency, and certified payrolls.

1.5.2.4 Report requirements and frequency.

1.5.2.5 Quality requirements.

1.5.2.6 Major material and equipment lists.

1.5.2.7 Other pertinent items.

1.6 CONSTRUCTION PROGRESS

1.6.1 Meetings held weekly at time and location determined at preconstruction meeting will be approximately one hour long.

1.6.2 KEH will chair meeting and request attendance of key personnel required. Authorized representatives of Contractor and pertinent subcontractors shall attend.

1.6.3 Purpose of meetings is to monitor status and provide forum for exchange of pertinent information related to the Work. Major topics may include, but not be limited to, following.

1.6.3.1 Schedule, cost, and construction status.

1.6.3.2 Design and scope changes.

1.6.3.3 Submittal status, key material, and equipment delivery status.

1.6.3.4 Potential problem areas.

1.6.3.5 Inspection and testing status.

1.6.3.6 Action item status, goals for next meeting.

1.6.3.7 Other appropriate items.

1.6.4 Meeting minutes will be issued by KEH as promptly as possible following meeting. Action items will be identified with assigned follow-up. Issues resolved will be reported in minutes, as well as closed action items.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTAL CONDITIONS

1.1.1 Materials and equipment fabricated or installed without required approved submittals, or which differ from approved Drawings or vendor data, are subject to rejection and replacement at the Contractor's expense.

1.1.2 Delays arising from failure to submit required Drawings and other related data described in Contract Documents, in a timely manner, will not constitute excusable delays for extensions, unless excusable under other provisions of the Contract.

1.2 SUBMITTALS REQUIRED

1.2.1 Required submittals are defined in Part 1, Article 1.2 of the specification sections.

1.2.2 Submittals are divided into two types; those requiring approval, and those not requiring approval. Included in the former are submittals of architectural material samples, where KEH reserves the right to make final selections.

1.2.3 Send submittals to KEH no later than the times indicated. Those requiring KEH approval must be approved before further submittal related procurement, fabrication, or construction is accomplished. This also applies for KEH selections made from samples submitted.

1.2.4 Approval required

1.2.4.1 Safety Program and Job Safety Analysis: Before badging of Contractor personnel, submit Safety Program and Job Safety Analysis as required by Section 55, Paragraph 55.1 of Contract General Conditions.

1.2.5 Approval not required

1.2.5.1 Certificates of First Aid Training (WISHA requirements): Before badging of Contractor personnel, submit Certificates of First Aid Training as required by Section 55, Paragraph 55.1 of Contract General Conditions.

1.2.5.2 Industrial Injury/Illness Experience: Before badging of Contractor personnel, submit Industrial Injury/Illness Experience as required by Section 55, Paragraph 55.3 of Contract General Conditions.

1.2.5.3 OSHA Form 200 Report: The 5th working day of each month, submit OSHA Form 200 Report as required by Section 55, Paragraph 55,5,1 of Contract General Conditions.

1.2.5.4 Equipment Certification: Before badging of Contractor personnel, submit Equipment Certification as required by Section 55, Paragraph 55.6 of Contract General Conditions.

1.3 SUBMITTAL REVIEWS

1.3.1 Submittals requiring approval will be reviewed to verify completeness and conformance to requirements. Appropriate dispositions will be made in accordance with Article 1.4 below.

1.3.2 Allow 21 calendar days for KEH review and disposition of submittals. This time period will be measured from date of submittal receipt in KEH's office to date of return mailing.

1.3.3 Submittals not requiring approval will be reviewed to verify completeness and adequacy for their intended purposes. If acceptable, these items are filed, and finally delivered to the Operating Contractor. Unacceptable items will be handled in accordance with Paragraph 1.4.5.

1.3.4 If a submittal not requiring approval has not been returned within the time period specified in Paragraph 1.3.2, and KEH has not informed the Contractor that additional review time is necessary, the Contractor may consider it accepted by KEH.

1.4 SUBMITTAL PROCEDURE

1.4.1 Transmit submittals using form KEH-1838, Data Transmittal/Review, sample included.

1.4.2 Identify each submittal by Section/Paragraph Number and Submittal Title. The number of copies required includes 2 copies to be returned to the Contractor. Provide additional copies required by the Contractor.

1.4.2.1 Items that require approval: Submit 6 copies, including one reproducible.

1.4.2.2 Samples for selections: Submit as required by the Sections of this Specification.

1.4.2.3 Items that do not require approval: Submit 10 copies.

1.4.3 Review each submittal for completeness, compliance with Contract Documents, and proper identification before sending to KEH. Submittal data shall either be stamped, showing the review process has taken place, or the Data Transmittal form may be stamped "Reviewed for Compliance," and signed. Submittals not stamped or signed will be returned without consideration.

1.4.4 Submittals requiring approval will be stamped by KEH, and marked "Approved," "Approved with Exception" or "Not Approved, Revise and Resubmit." Approval of submittals does not relieve the Contractor of responsibility for errors contained therein.

1.4.4.1 Approved submittals are identified by the submittal stamp, with either the "Approved" or "Approved with Exception" box checked. "Approved" signifies general concurrence of submittal conformance with Project design concepts and compliance with Contract Document requirements. "Approved with Exception" signifies general concurrence, with noteworthy comments or clarifications. Approval of a specific item shall not be construed as approval of the system or assembly of which that item is a component.

1.4.4.2 A submittal which is not approved is identified as "Not Approved, Revise and Resubmit." The submittal is considered technically deficient, or incomplete, and therefore unacceptable. Resubmittal is required, hence fabrication, procurement, or performance of procedures shall not proceed.

1.4.4.3 Upon receipt of deficient submittal data, make corrections noted on the transmittal, and resubmit data to KEH.

1.4.5 Submittals not requiring approval that are found to be incomplete or inadequate will be returned marked "Resubmit." An explanation of the deficiencies will be included, for corrective action by the Contractor. Resubmit in accordance with subparagraph 1.4.4.3.

1.4.6 Procedures for performing certain types of work must be submitted for approval before work is commenced. Such procedures which have previously been approved by KEH, for work similar to that to be accomplished on this Project, may not need to be reapproved. Forward 1 copy of previously approved procedures to KEH, by Data Transmittal form, and identify each by Section/Paragraph Number, Title, and either procedure number or project number for which the procedure was approved. Submittals will be reviewed by KEH and, if acceptable, retained for record. If a previously approved procedure is not acceptable, the submittal will be returned, with requirements for resubmittal.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

KAISER ENGINEERS HANFORD

DATA TRANSMITTAL/REVIEW

Submittal No. _____

To | From

Sheet _____ of _____

Project Title | Date

PO No. | Project No. | WO No. | Bldg. No. | DISTRIBUTION

Subcontract No. | Subcontractor or Supplier

☐ Pre-Purchase Evaluation ☐ Approval Data ☐ VI ☐ Information/Record

Paragraph | Section | Specification

Description of Item Submitted

Special Instructions:

☐ Resubmit ☐ Substitution

☐ Additional Info. ☐ As Specified Material

Data Furn.	Data Description	Disposition					
		Not Recvd.	Data Incompl.	Appd.	Appd./X	Not Appd.	Resub. Reqrd.
	Dimensional Drawings						
	Equipment Weights						
	Specifications						
	Material Description						
	Performance Data						
	Circ./Control Diagram						
	Data Sheets						
	Illustrative Cuts						
	Install Instructions						
	Operat. Instructions						
	Maint. Instructions						
	Spare Parts List						

Date

Submittal proposes deviations from contract documents? ☐ Yes ☐ No

To | From

☐ Appd. ☐ Not Appd. ☐ Appd./X ☐ Resub. ☐ Inform./Record

Changes Required to Contract Documents? ☐ Yes ☐ No

Released By | Date

KEH-1838.01 (10/91)

KAISER ENGINEERS HANFORD	DATA TRANSMITTAL/REVIEW			Submittal No. _____
Project Title				Sheet _____ of _____
PO No.	Project No.	WO No.	Bldg. No.	Date
Subcontract No.		Subcontractor or Supplier		
Comments:				

KEH-1838.02 (10/91)

END OF SECTION

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SECTION 01310

PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required

1.2.1.1 Progress Schedules: 10 days after notice of award, submit following schedules required in Article 1.3 for duration of contract.

1.2.2 Approval Not Required: None

1.3 PROGRESS SCHEDULES

1.3.1 Schedules identified in Section 5 of the Contract General Conditions shall be in accordance with following.

1.3.1.1 Show order Contractor proposes to carry on the Work, starting dates of the several salient features of the Work including procurement of materials and equipment, and contemplated dates for completion. Each schedule shall be in form of bar chart of suitable scale to show percentage of Work scheduled for completion at any time with separate bar for each activity. At end of each week or at end of other periods of time specified in Contract, prepare and submit one copy of chart showing actual progress at end of period.

1.3.2 Organize schedule to show activities relative to each major subcontractor and supplier. Provide subschedule to define critical portions of entire schedule.

1.3.3 Schedule shall include design activities and milestones, delivery date of design documents, construction activities, progress milestones, and include, but not be limited to, following activities.

1.3.3.1 Bond and insurance.

1.3.3.2 Mobilization.

1.3.3.3 Survey.

1.3.3.4 Place sandy soil fill.

1.3.3.5 Install neutron probe access tubes in fill.

1.3.3.6 Install pan lysimeters.

1.3.3.7 Install collection piping.

1.3.3.8 Install vaults for siphons.

1.3.3.9 Coat inside of vaults with bitumastic.

1.3.3.10 Install dosing siphons and vault piping.

1.3.3.11 Place top course surfacing.

1.3.3.12 Place asphaltic concrete in terraces and as test pad.

1.3.3.13 Apply fluid applied asphalt.

1.3.3.14 Construct gutters and install upper portion of collection system piping.

1.3.3.15 Place concrete curbing and gutter crickets.

1.3.3.16 Place drainage gravel.

1.3.3.17 Place basalt.

1.3.3.18 Place gravel filter.

1.3.3.19 Place clean fill sideslope.

1.3.3.20 Place sand filter.

1.3.3.21 Place lower layer of silt.

1.3.3.22 Install neutron probe access tubes in silt.

1.3.3.23 Blend silt with pea gravel and place.

1.3.3.24 Grade and compact access road.

1.3.3.25 Place gravel stabilization.

1.3.3.26 Punchlist, clean up sites.

1.3.3.27 Demobilize.

1.3.4 Schedule shall show, as minimum, accumulated percentage of completion of each activity and total percentage of work completed as of last work day of each month.

1.3.4.1 Develop an "S" curve from percentage of total work figures and superimpose on schedule.

1.3.4.2 Show dollar value or percentage of total next to each activity shown on schedule. Figures will be basis for determining progress payments described in Section 01027.

1.4 REVISIONS TO SCHEDULES

1.4.1 Whenever KEH determines there are significant variances between actual and scheduled progress, endangering completion within Contract

completion time, Contractor may be required to prepare and submit revised schedules.

1.4.2 Show progress to date of submittal and projected completion date of each activity. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.

1.4.3 Provide narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken, or proposed, and its effect, including changes on schedules of separate contractors.

1.4.4 Distribute copies of revised schedules to KEH Project file, subcontractors, suppliers, and other concerned entities. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in revised schedules.

1.4.5 If Contractor fails to submit progress schedule specified in Paragraph 1.3.1 within prescribed time, or revised schedules specified in Paragraph 1.4.1, within requested time, KEH may withhold approval of progress payments until time Contractor submits required schedules.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01400

QUALITY ASSURANCE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 The following documents, including others referenced therein, form part of this Section to the extent designated herein.

1.1.1.1 Environmental Protection Agency (EPA)

EPA/530-SW-86-031	Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities

1.1.1.2 Kaiser Engineers Hanford (KEH)

GG-DETE-01	Detection and Exclusion of Misrepresented Products

1.2 SUBMITTALS

1.2.1 See Section 01300 for submittal procedures.

1.2.2 Approval Required: None

1.2.3 Approval Not Required: None

1.3 CONTRACTOR QUALITY ASSURANCE/CONTROL SYSTEM

1.3.1 Contractor shall assure compliance with Section 14 of the Contract General Conditions. Specific Contractor quality activities shall include, but not be limited to, the following.

1.3.1.1 Providing special controls, processes, test equipment, tools, and skills to ensure that the required quality is inherent in finished work.

1.3.1.2 Ensuring subcontracted activities meet the required technical and quality requirements as identified in the Contract Documents.

1.3.1.3 Procurement control: Ensure that controls for product procurement and receiving activities include actions to prevent the use of misrepresented products. As a minimum, these controls shall include the considerations and requirements of Article 1.4.

1.3.1.4 Document control: Provide measures to ensure that the latest approved issues of Contract Documents are used for procurement, manufacturing, fabrication, assembly/installation, inspection, and testing.

1.3.1.5 Inspection and testing:

a. Perform verifications to ensure work activities meet the requirements of the Contract Documents, including minimum code and standard requirements.

b. Ensure work is complete and Contract requirements have been met before requesting overview inspection by KEH.

c. Maintain a positive system for identifying inspection/verification status of contract work.

1.3.1.6 Control of nonconforming items: Provide a method of notification to KEH for all construction items and activities which do not conform to requirements. Notification shall be given to the KEH Field Contract Engineer.

1.3.2 KEH may review/audit Contractor compliance with the Contract Documents.

1.4 EXCLUDING MISREPRESENTED PRODUCTS

1.4.1 Take measures to prevent incorporation of misrepresented (ie, suspect/counterfeit) products into the work.

1.4.2 Methods To Detect And Exclude Misrepresented Products

1.4.2.1 Obtain products from original manufacturers, their authorized distributors, or other established and reliable sources only.

1.4.2.2 During the initial stages of procurement, the Contractor should be suspicious of quoted prices significantly lower, or delivery times significantly shorter, than those of competitors. Such quotations may be an indication that misrepresented products are being offered.

1.4.2.3 Products received should be in boxes or containers bearing original manufacturer's labels, except for bulk or lot materials that are repackaged for shipment in quantities ordered.

1.4.2.4 Screen newly procured products using screening information provided in KEH GG-DETE-01. Also, perform screening activities on previously procured (ie, stock on hand) products that are scheduled to be incorporated into the work. Screening activities should, at a minimum, include the following:

a. Screening to identify the source of the products (manufacturer, authorized distributor, or other reliable source).

b. Screening for false marking as to class, type or grade. See KEH GG-DETE-01, Paragraph 4.4.

c. Screening for false labeling indicating qualification or approval by nationally recognized agencies (eg. UL Listed). See KEH GG-DETE-01, Paragraph 6.3.

d. Screening for used products being represented as new. See KEH GG-DETE-01, Paragraph 3.2.

e. Screening for falsified quality affecting documentation (eg, Certified Material Test Reports) being used as the basis for product acceptance. See KEH GG-DETE-01, Paragraph 4.3.

1.4.3 Documentation

1.4.3.1 Invoices and shipping documentation should be addressed to the contractor and should indicate that products were procured from the original manufacturer, authorized distributors, or other established/reliable sources.

1.4.4 Products identified in GG-DETE-01, Attachment A, are considered unacceptable and shall not be used in Contract work.

1.4.5 Upon detection of suspect products, provide notification and document deficiency to KEH in accordance with Section 2.0 of KEH GG-DETE-01.

1.4.5.1 Segregate suspect products and maintain control to prohibit use in Contract work. Obtain direction from KEH for proper disposal of suspect products.

1.4.5.2 If Contractor procurement/screening activities result in partial but inconclusive evidence of suspect products, contact the designated KEH representative for additional direction/assistance.

1.5 INSPECTING AND TESTING

1.5.1 In accordance with Section 19 of the Contract General Conditions, the Contractor shall perform all inspection and testing identified in this specification as Contractor responsibility.

1.5.2 In accordance with Section 19 of the Contract General Conditions, KEH will perform all inspections and testing identified in this specification as KEH responsibility, including the following.

1.5.2.1 Perform Construction Quality Assurance (CQA) activities in accordance with EPA/530-SW-86-031.

1.5.2.2 Witness specific inspection and witness points.

1.5.2.3 Perform final acceptance inspection.

1.5.3 Specific Inspection Points: Adhere to inspection points. Ensure that personnel have completed inspections of, and approved portions of work in accordance with Contract requirements, before notifying KEH.

1.5.3.1 Specific inspection points are defined as follows.

a. Construction inspection (H): Required for witnessing of specific construction features, before further construction is allowed to proceed.

b. Receiving (R): Special items of fabrication, equipment, or material scheduled to be delivered to the Project site, or other designated location, which require inspection upon arrival and before installation. Notify KEH within four hours after item arrival.

c. Witness (W): Selected for inspection at the option of KEH. Work may proceed upon verbal release by KEH or upon expiration of one hour beyond scheduled time of witnessing.

1.5.3.2 H, R, and W points apply to both onsite and offsite work. Except where a longer period is specified, notify KEH at least four working hours before each point for onsite work. For offsite work, notify KEH at least three working days before each required point.

1.5.3.3 H, R, and W points are listed in Article 1.7.

1.6 OPEN ITEM AND NONCONFORMANCE REPORTING

1.6.1 KEH utilizes Open Item Reports and Nonconformance Reports (NCR) to document incomplete items and/or deviations from Contract requirements.

1.6.1.1 Open Item Reporting: Open items are systems or components that are found to be incomplete or require follow-up inspection (ie, are in the process of construction or fabrication). Open items are documented on an Open Items Report prepared by KEH. Items shall be corrected/completed by the Contractor without additional direction from KEH. Correction/completion shall bring the item into compliance with Contract requirements using existing procedures and instructions that were established by the Contract.

1.6.1.2 Nonconformance report: Documented on nonconformance report (NCR) forms. NCRs document deviations from Contract requirements when characteristic, documentation, or procedure renders quality of an item or activity unacceptable, or indeterminate. Nonconformances are identified by a red construction hold tag, or blue NCR tag. A hold tag prohibits movement, installation, processing, or further fabrication of nonconforming items pending approval of the NCR disposition. An NCR tag identifies a nonconformance, but allows work to proceed based on an approved NCR disposition. No action shall be taken to correct or alter an actual condition before receipt of an approved disposition. Tags are not to be removed by anyone other than the agency who applied the tag.

1.6.2 The Contractor shall ensure its organization is represented by individuals with sufficient authority to commit the Contractor to corrective action requirements identified by KEH.

1.6.3 Open items and nonconformances reported during performance of the Contract require resolution before completion and final payment.

1.7 SCHEDULE FOR H, R, AND W POINTS

Section Number	Subject	Type	Offsite	Onsite
02200/1	Compaction Procedure Demonstration	H*		X
02200/2	Initial Placement of Fractured Basalt	H		X
02200/3	Initial Placement of Cover Material Over Encasements	H		X
02200/4	Initial Placement of Gravel Filter	H		X
*Allow 3 working days to obtain proctor before backfilling.				
02200/5	Initial Placement of Clean Fill	H		X
02200/6	Initial Placement of Sand Filter	H		X
02200/7	Placement of Geotextile	W		X
02200/8	Initial Placement of Lower Silt Layer	H		X
02200/9	Initial Placement of Admixed Silt	H		X
02200/10	Initial Placement of Crushed Surfacing	H		X
02514/1	All Placement of Asphaltic Concrete	H		X
02650/1	Initial Cover Over Lower Neutron Probe Access Tubes	W		X
02650/2	Water Volume Siphon Vault Installation	H		X
02650/3	Siphon Charging and Calibration	W		X
02650/4	Placement of Upper Neutron Probe Access Tubes	W		X
02650/5	Flushing of Pipelines	W		X
02650/6	All Leak Pressure Testing	H		X

Section Number	Subject	Type	Offsite	Onsite
02750/1	Prior to Covering Geosynthetics	H		X
02779/1	All placement of Fluid Applied Asphalt	H		X
02935/1	Initial Placement of Soil Stabilization	H		X
03300/1	Initial Placement of Curbing	W		X

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 National Fire Protection Association (NFPA)

701	Fire Tests for Flame-Resistant Textiles and Films, 1989 Edition

1.1.1.2 Washington State Department of Transportation (WSDOT)

M41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required

1.2.1.1 Backflow Prevention Device Test Report: Before release of hydrant, submit test report.

1.2.2 Approval Not Required: None

1.3 CONSTRUCTION FACILITIES

1.3.1 First Aid: Facilities are available at Building 2719EA in the 200 East Area and Building 2719WA in the 200 West Area to provide first line medical attention.

1.3.2 Operation and Storage Areas: Confine onsite operations, including storage of materials, to areas at the site as designated by KEH.

1.3.3 Waste Disposal

1.3.3.1 Radiation survey release: Waste generated during construction, including excess excavation, shall be surveyed by onsite technicians for radiation contamination, and formally released prior to transport off the project site. Phone 372-1355 to schedule a technician. Allow 4 hours for completion of the survey.

1.3.3.2 Disposal site: Dispose of construction debris at the Hanford Site Central Landfill, approximately 18 road miles from the project. A Solid Waste Disposal Request shall be completed by the Contractor, and signed by the Radiation Technician prior to taking waste to the site. Forms are available from KEH. The site is open between 8:30 a.m. and 2:30 p.m.

1.3.3.3 Dispose of broken asphalt at Pit Number 10, located approximately 25 miles from the jobsite.

1.3.3.4 Dangerous waste: See Section 01100.

1.4 TEMPORARY UTILITIES

1.4.1 Water

1.4.1.1 Construction: Available from existing construction riser west side of Project site. Fittings provided by Contractor for connection to water source shall be approved by KEH before installation. Remove temporary piping, hoses, fittings, and valves before final acceptance of the Work.

1.4.1.2 Drinking: Furnish adequate drinking water, that meets health and safety requirements, to employees.

1.4.2 Electric Power: Electrical power needed at the jobsite is the responsibility of the Contractor. There is no electrical power available at the jobsite.

1.4.3 Telephone: Telephones are not available at the jobsite or borrow areas. Telephones are the responsibility of the Contractor. The Contractor shall furnish cellular phone communication at the jobsite and borrow areas during the Work.

1.4.4 Sanitary Facilities: Furnish and service chemical or other approved sanitary toilets for employee use. Facilities shall meet requirements of KEH which are available upon request.

1.5 ACCESS ROADS AND PARKING AREAS

1.5.1 Parking for Contractor's Company vehicles will be made available in vicinity of the Work. "No Parking" signs are posted to show fire and emergency lanes. No on-street parking will be permitted.

1.5.2 Grass Fire Prevention: To reduce potential for grass fires, keep off-road driving to minimum. Vehicles driving off-road or to remote locations, shall carry a minimum 10 pound ABC dry chemical portable fire extinguisher, communications equipment consisting of a mobile phone (CB type radios are not acceptable), and shovel. Report fires immediately to nearest Hanford Patrol and Hanford Fire Department.

1.6 TEMPORARY CONTROLS

1.6.1 Dust Control: Maintain work areas to prevent hazard or nuisance to others. Accomplish dust control by sprinkling or other methods approved by KEH. Repeat sprinkling at necessary intervals to keep disturbed area damp at all times. Keep sufficient equipment on Project to accomplish dust control as work proceeds and whenever dust nuisance or hazard occurs. Cover silt during hauling to minimize drying and dust generation. No separate or direct payment will be made for dust control and cost shall be considered incidental to and included in Contract price.

1.6.2 Temporary Enclosures: Plastic sheeting materials used to form enclosures shall be minimum 6 mils thick and have fire retardant properties meeting the requirements of NFPA 701. Acceptable manufacturers are Winman Corp (Plastic Division), St. Cloud, Minnesota; Lancs Industries, Kirkland, Washington; and Protective Plastics, Inc, Greer, South Carolina.

1.6.3 Traffic Control: Temporary traffic control and barricades in accordance with WSDOT M41-10, Section 1-07.23(3).

1.6.3.1 Vehicle and equipment movement

a. Slow moving vehicles and equipment shall not travel on Hanford Site roads during heavy traffic periods between 6:30 and 8:00 am, and 3:30 and 5:30 pm.

b. Do not block existing roads.

c. Do not park on roadway shoulders.

1.6.3.2 Oversized vehicles and loads

a. Permits specified in Section 01065 are required for vehicles or loads exceeding following dimensions.

1) Width: 8'-6".

2) Height: 14 feet.

3) Length: Single unit, 40 feet.
Single trailing unit, 48 feet.

b. Additional requirements for vehicles and loads exceeding 8'-6" width.

1) Display oversize load sign on front of towing vehicle and rear of trailing unit.

2) Attach red flags to each corner.

3) Notify KEH 5 days before moving loads.

4) Travel between 9:00 am and 2:30 pm unless special arrangements are made.

c. Escort vehicle requirements.

1) Equip with oversize load signs and amber lights.

2) Vehicles or loads over 10 feet wide: Provide escort cars in front and rear on 2 lane highways.

3) Vehicles or loads over 14 feet wide: Provide escort car in rear on multiple lane highways.

4) Vehicles or loads over 20 feet wide: Provide escort cars in front and rear on multiple lane highways.

d. Electrical escort requirements: KEH will provide qualified electrical escorts, at no cost to Contractor, when load reaches height of 14 feet or more from road surface, or when clearance of at least 6 feet cannot be maintained from overhead electrical or signal lines. Notify KEH at least 3 working days before escort is required.

1.7 FIELD OFFICE

1.7.1 Establish a field office equipped and staffed to conduct the Work. Keep copies of Drawings, Specifications, and other information pertinent to the Work at office. KEH shall have access to documents at all times. Telephone service will be made available at field office as specified in Paragraph 1.4.3 providing service is available. Contractor may utilize existing telephones, at buildings designated by KEH, for local calls.

1.7.2 Anchor or tie down portable or relocatable structures, including trailers for field offices and storage, to prevent overturning or lateral movement in winds up to 70 mph. Enclose or skirt underfloor area with material that will not burn or support combustion to prevent accumulation of wind-blown debris and use of underfloor space for material storage. Complete anchoring and enclosing within 14 days of arrival onsite.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 REFERENCES: Not Used

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Substitution Approval Request(s): Submit request(s) as required by Paragraphs 1.3.4 and 1.3.5, prepared in accordance with Article 1.6.

1.3 SUBSTITUTIONS

1.3.1 Products include those items identified on the Drawings as well as in Part 2 of the Specification Sections.

1.3.2 Product options given in the Specification Sections represent functionally and physically similar items. In addition to generic type, form and size, physical similarity includes maintainability, reliability, and durability characteristics.

1.3.3 A substitute product may be used in place of a product or the product options identified in Specification Sections, without approval, if it is functionally and physically similar as defined above.

1.3.4 Substitution of a product that is functionally similar but physically dissimilar will require submittal of a Substitution Approval Request.

1.3.5 Submittal of a Substitution Approval Request is also required when a product callout in the Specification Sections includes the phrase "or an approved substitute".

1.3.6 Products required in quantity within Specification sections shall be the same and be interchangeable.

1.3.7 Do not use materials and equipment removed from existing structure, except as specifically required or allowed by Contract Documents.

1.4 LIMITATIONS ON SUBSTITUTIONS

1.4.1 Substitutions will not be considered when indicated or implied on fabricator drawings, or product data submittals, without separate Substitution Approval Requests, when requested directly by subcontractors or suppliers, or when acceptance will require substantial revision of Contract Documents.

1.4.2 Substitute products that require a substitution approval request shall not be ordered or installed before the request is approved.

1.4.3 Only one Substitution Approval Request for each product will be considered. When a substitution is not accepted, provide specified product.

1.4.4 KEH will determine acceptability of substitution approval requests.

1.5 REQUESTS FOR SUBSTITUTIONS

1.5.1 Submit a separate Substitution Approval Request for each substitution, using Form KEH-1151, sample included.

1.5.2 Identify products by Specification Section and Article or Paragraph numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.

1.5.3 To each Substitution Approval Request attach descriptive information for substitute and original products. The information shall consist of drawings, calculations, and data as appropriate to define operational and physical characteristics of products, and establish a basis for comparison.

1.5.4 Give an itemized comparison of proposed substitution with specified product, listing variations, with reference to Specification Section and Article or Paragraph numbers.

1.5.5 Give quality and performance comparisons between proposed substitution and specified product.

1.5.6 Give cost data comparing proposed substitution with specified product, showing the Contract Sum net change.

1.5.7 List availability of maintenance services and replacement materials.

1.5.8 State effect of the substitution on construction schedule, and changes required in other work or products. If a substitute product requires or necessitates revisions to structures, foundations, footings, services, systems, piping, electrical, etc., engineering costs shall be borne by Contractor. Submit drawings, calculations, and vendor data, clearly showing revisions to accommodate substitution, for approval.

1.5.9 KEH will review and disposition requests for substitutions within 10 working days, unless evaluation requires extensive comparison or consultation.

1.5.10 For accepted substitute products make the same submittals, in accordance with Section 01300, required for the original products.

1.6 CONTRACTOR REPRESENTATION

1.6.1 Request for substitution constitutes representation that Contractor has investigated proposed product, has determined that it is equal to or superior to that specified, and that cost reduction offered (if there is one) is ample justification for accepting offered substitution.

1.6.2 Provide same warranty for a substitute as for specified product.

1.6.3 Coordinate installation of accepted substitutes, making changes required for work to be completed.

1.6.4 Certify that cost data presented is complete, and includes related costs under the Contract.

1.6.5 Waive claim for additional costs related to substitutions which may later become apparent.

1.6.6 Waive claim for additional performance time resulting from product substitutions.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

KAISER ENGINEERS HANFORD	SUBSTITUTION APPROVAL REQUEST

From (Contractor) _____ Contract No. _____

Project _____

Description of Proposed Substitution _____

_____

We hereby submit for consideration the following product instead of specified item for above project:

Specification No. _____ Section _____

Drawing No. _____ Section or Zone _____

Specified Item _____

Proposed Substitution _____

Attach complete technical data, including laboratory tests and samples, as applicable.

Provide detailed comparison of the significant qualities (system performance, interface requirements, size weight, durability, performance and similar characteristics, and including visual effect where applicable) for the proposed substitution of comparison with the original requirements.

Describe other changes to drawings and specifications required by proposal as outlined below and attach additional information as necessary.

Complete Each Item

A. Changes to drawing dimensions _____

_____

B. Effect of substitution on other systems _____

_____

C. Outline differences between proposed substitution and specified item _____

_____

_____

D. Manufacturer's guarantees of proposed and specified items are:

_____ Same _____ Different (explain on attachment)

Undersigned attests function, and quality equality equivalent or superior to specified item and has reviewed General Conditions paragraph GC-13 for assignment of responsibility if the substitution is approved.

Submitted By	Signature	
Address		Date
		Phone

KEH-1151.00 (10/87)

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington Administrative Code (WAC)

Title 296	Labor and Industries
Chapter 296-155	Safety Standards for Construction Work

1.2 SUBMITTALS: Not Used

1.3 RECORD REQUIREMENTS

1.3.1 Hanford site work requires that certain documents, defined herein, be used to record the construction process and administration of the Contract. KEH will assemble pertinent data for final disposition. Prepare, preserve, and deliver project record documents required by this Contract to KEH. Documents are in addition to submittals required in Section 01300.

1.3.2 Mark documents that will become project records prior to use for construction. Keep copies of project record documents in field office, and make available to KEH during progress of Work.

1.3.3 Some data required for project records shall be delivered to KEH during course of construction and contract administration, while others shall be assembled after completion of construction for delivery to KEH. Document delivery by retaining copy of reports delivered during course of work until construction completion, retaining copy of letter of transmittal itemizing delivered items, or other means acceptable to KEH.

1.3.4 When information for project records is to be recorded on standard KEH forms, copies of the forms will be supplied by KEH. Samples of the appropriate required forms are included in the specification sections.

1.4 DOCUMENT IDENTIFICATION

1.4.1 General: Documents required for project records are itemized herein. Identify complete documents by title or number. Notes or markings added by hand shall be legible utilizing permanent nonsmearing marking media, such as ink or felt tip markers, in contrasting color.

1.4.2 Storage and Marking: Store one set in the field office, apart from documents used in construction, and maintain in clean, dry, and legible condition. Legibly mark items to record actual construction, including changes to dimensions and details, manufacturer's name, catalog number, and substitute products.

1.4.3 Activity and Administrative Documents: Deliver or retain in accordance with following.

1.4.3.1 Certified Payrolls: Each week deliver certified payrolls, as required by Section 108 of Contract General Conditions, to KEH, and keep copies in the field office until Contract completion. Progress payments will not be processed unless certified payrolls for work periods have been received by KEH.

1.4.3.2 Weekly Manpower Reports: Prepare weekly manpower reports and deliver, before 10 am on Monday, for previous week, during performance of Contract. Forms will be furnished by KEH.

1.4.3.3 Weekly Safety Meetings: Conduct weekly walkaround safety inspections and safety meetings in accordance with WAC-296-155-110. Deliver one copy of meeting minutes to KEH, as completed.

1.4.3.4 Periodic Equipment Inspections: Document initial and followup, periodic heavy equipment inspections by the Contractor. Deliver one copy to KEH, as completed.

1.4.3.5 Backfill Permit: Retain backfill permits approved for work required in Division 2.

1.4.3.6 Joint locations: Deliver documentation of joint locations required in Division 2.

1.4.3.7 Soil Compaction Procedure: Retain Forms KEH-0382 completed for work required in Division 2.

1.4.3.8 Pour Slips: After obtaining KEH approval of concrete pour slips required in Division 3, deliver copies to KEH, and retain Contractor copies until Contract closeout. After closeout deliver them to KEH.

1.4.3.9 Trip Tickets: Deliver copies to KEH with each truck load of concrete required in Division 3, and retain Contractor copies until Contract closeout. After closeout deliver them to KEH.

1.4.4 Construction, Quality Assurance, and Supporting Documents: Deliver in accordance with following when called for in specification sections.

1.4.4.1 Flushing/Cleaning Records: One copy of records verifying acceptable completion of flushing and cleaning, within 5 days after completion.

1.4.4.2 Leak/Pressure Testing Records: One copy of records verifying acceptable completion of leak and pressure testing, within 5 days after completion.

1.4.4.3 Electrical Testing: One copy of records verifying acceptable completion of electrical insulation, continuity, and grounding tests, within 5 days after completion.

1.4.5 Product Samples and Manufacturer's Instructions: In addition to submittals required in Section 01300, and requirements of this Section, information received by Contractor (from suppliers) that documents products used, and how they were installed, shall be delivered to KEH for Project Records.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

A 36/A36M-91	Standard Specification for Structural Steel
D 653-90	Standard Terminology Relating to Soil, Rock, and Contained Fluids

1.1.1.2 American Water Works Association (AWWA)

C502-85	Dry-Barrel Fire Hydrants

1.1.1.3 Washington Administrative Code (WAC)

Title 296	Labor and Industries
Chapter 296-155	Safety Standards for Construction Work

1.1.1.4 Washington State Department of Transportation (WSDOT)

M 41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required

1.2.1.1 Certificate of Experience: With bid, submit "Certificate of Experience" showing successful completion of activities for a facility or facilities regulated under the Resource Conservation and Recovery Act. Construction experience for such facilities shall total at least 5577 m^2 (60,000 ft^2) of area to receive waste. Include addresses and telephone numbers for completed project(s).

1.2.1.2 Handling, Placing, and Compaction Procedure: 15 working days prior to material placement submit proposed procedure defining methods for delivering, any job site storage, placing, spreading, and compaction or consolidation of materials to meet specified requirements. Materials include sandy soil, clean fill, basalt, shoulder ballast, drainage gravel,

top course, gravel filter, base course, sand filter, and silt (upper and lower layers).

1.2.2 Approval Not Required

1.2.2.1 Material Test Reports: Before delivery of materials to barrier site, submit Material Test Reports as specified in Paragraph 3.4.2.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Storage: Cover basalt, drainage rock, and gravel stored at project site to protect from blowing sand and debris.

1.3.2 Stockpile: As needed, stockpile material in accordance with WSDOT M 41-10 Section 3-02.2(6). Remove material from stockpile, in accordance with WSDOT M 41-10 Section 3-07.2.

1.4 QUALITY ASSURANCE

1.4.1 Product Acceptability: See Section 01400, Article 1.4 for required measures to prevent the use of misrepresented products.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General: Obtain specified soils from excavation or other designated locations. Obtain onsite approval for soils.

2.1.2 Sandy Soil (Structural Fill or Backfill): Well graded soil mixtures which may contain cobbles up to 75 mm (3 inches) in greatest dimension if uniformly distributed and not constituting more than 20 percent of volume of fill. Obtain from borrow area approved by KEH.

2.1.3 Clean Fill (Side Slope/Dike Material/Pit Run Gravel/Common Fill): Well graded soil mixtures containing cobbles up to 200 mm (8 inches) in greatest dimension if uniformly distributed and not constituting more than 40 percent of volume of fill. Obtain from borrow area approved by KEH.

2.1.4 Basalt: Uncleaned, well blasted (overshot) basalt having uniform gradation with an average particle size (by weight) of approximately 100 mm (4 inches). Basalt shall not be greatly weathered or highly vesicular (no flow tops). Obtain from borrow area approved by KEH. Obtain explosives permit (see Section 01065).

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size	Percent Passing
250 mm (10 in.)	100
125 mm (5 in.)	50 to 70
75 mm (3 in.)	30 to 50
15 mm (5/8 in.)	0 to 5

2.1.5 Shoulder Ballast: Use ballast meeting the requirements of WSDOT M 41-10, Section 9-03.9(2).

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size	Percent Passing
64 mm (2-1/2 in.)	100
20 mm (3/4 in.)	40 to 80
6.3 mm (1/4 in.)	5 max
0.15 mm (No. 100)	0 to 2
% Fracture	75 min

2.1.6 Drainage Gravel: Use thoroughly washed and screened, naturally occurring gravel meeting the requirements of coarse aggregate specified in WSDOT M 41-10 Section 9-03.1(3)C, Grade 5.

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size	Grading No. 5 Percent
25 mm (1 in.)	100
20 mm (3/4 in.)	80 to 100
10 mm (3/8 in.)	10 to 40
4.76 mm (No. 4)	0 to 4
0.074 mm (No. 200)	0 to 0.5

2.1.7 Top Course and Gravel Filter: Use screened crushed surfacing meeting the requirements of WSDOT M 41-10, Section 9-03.9(3) Top Course.

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size	CSTS Percent
16 mm (5/8 in.)	100
6.3 mm (1/4 in.)	55 to 75
0.42 mm (No. 40)	8 to 24
0.074 mm (No. 200)	0 to 10
% Fracture	75 min

2.1.8 Base Course: Use screened crushed surfacing meeting the requirements of WSDOT M 41-10, Section 9-03.9(3) Base Course.

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size		CSTS Percent
32 mm	(1-1/4 in.)	100
16 mm	(5/8 in.)	50 to 80
6.3 mm	(1/4 in.)	30 to 50
0.42 mm	(No. 40)	3 to 18
0.074 mm	(No. 200)	7.5 max
% Fracture		75 min

2.1.9 Sand Filter: Naturally occurring or blended sand.

a. Percents finer by weight than each sieve.

Nominal Square Opening Sieve Size		Sand Percent
10 mm	(3/8 in.)	100
4.76 mm	(No. 4)	95 to 100
2 mm	(No. 10)	85 to 100
0.84 mm	(No. 20)	40 to 95
0.42 mm	(No. 40)	17 to 80
0.15 mm	(No. 100)	5 to 35
0.074 mm	(No. 200)	1 to 25

2.1.10 Pea Gravel: Screened gravel, 100 percent passing a 10 mm (3/8 inch) sieve and 98 percent retained on a No. 10 sieve.

2.1.11 Pipe Bedding: Sand, defined in ASTM D 653, or excavated sandy material having less than 20 percent gravel particles and maximum dimension of 13 mm (1/2 inch).

2.1.12 Encasement Bedding: Same as Paragraph 2.1.7.

2.1.13 Silt: Naturally occurring silt or silt loam, well graded, having more than 30 percent by weight passing the No. 230 sieve. Borrow area (Section 01019) located at McGee Ranch. Add moisture as required to facilitate handling. See Section 01500, Paragraph 1.6.1 for transporting and protecting silt. Keep surface of silt wetted after placement. Moisture content shall not exceed 8 percent by weight.

2.2 MIXES

2.2.1 Proportions: Size, grade, and quantity of materials shall be proportioned and mixed to produce a mixture meeting the following requirements.

2.2.1.1 Silt: 85% ±3%.

2.2.1.2 Pea gravel: 15% ±3%.

2.2.2 Mixing: Pug mill materials to admix upper silt layer with pea gravel:

2.2.2.1 Pug mill meeting the following requirements.

a. Each material shall be measured by weighing. The weighing of each material shall be a distinct operation.

b. A metering device shall measure and control any water added to the mix.

c. Material retention time within the pug mill box shall be sufficient to assure a uniform mix.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Prior to placement of the subgrade fill, prepare subgrade in accordance with WSDOT M41-10 Section 2-06.3(1)6.

3.1.2 Pit Clearing and Grubbing: Before removal of material from pits, clear and grub the anticipated affected area within the pit according to WSDOT M 41-10, Section 2-01.1. Clearing and grubbing activities shall be sufficient to minimize vegetation in the excavated material.

3.2 EXCAVATION

3.2.1 Before performing excavation, obtain excavation permit. Excavation permits will be furnished as set forth in Section 01065.

3.2.2 Trenches for Underground Piping

3.2.2.1 Make excavations to line and grade shown on the Drawings and wide enough to make connections. Excavate with near vertical sides from bottom of trench up to 0.3 meter above utility lines. Excavate trench deep enough to permit placement of compacted sand bedding, 100 mm minimum thickness, beneath lines except where excavation is in undisturbed sand which will serve as bedding or where lines are to be encased in concrete. Pare holes in trench bottoms for pipe couplings so pipe will bear full length of barrel or section.

3.2.2.2 Side slopes of excavations or trenches more than 4 feet deep shall not exceed 1-1/2 horizontal to 1 vertical, and shall be in accordance with WAC 296-155, Part N, Figures N-11 and N-12. Install shoring in accordance with WAC 295-155, Part N, as required to hold materials and surcharge pressure for full depth of trench.

3.2.2.3 Keep trenches free of standing water, frost, or frozen earth when pipe placement is in progress.

3.2.2.4 If over-excavation occurs, correct by placement of structural backfill.

3.3 INSTALLATION

3.3.1 Fill and Backfill

3.3.1.1 General

a. Backfill permit: Do not start fill or backfill without approved permit as set forth in Section 01065.

b. Remove debris and organic matter from area to be filled or backfilled.

c. Use only specified materials for fill or backfill. Keep materials free of frozen particles, lumps, organic matter, and trash.

d. Do not place fill or backfill on frozen ground.

e. Filling or backfilling by sluicing or flooding with water will not be permitted.

f. Use laser-guided bulldozers and graders for final placement and shaping of the materials in the various layers.

3.3.1.2 Structural

a. Before placement of fill or backfill, demonstrate, to KEH by physical test at site, that the procedure proposed for installation and compaction of soils will provide the degree of compaction specified. Prepare "Soil Compaction Procedure" Form KEH-382, sample appended, in accordance with printed instructions. Forms will be provided by KEH.

b. Place backfill in accordance with WSDOT M41-10, Section 2-03.3(14)C, Method C.

c. Compaction control tests shall be in accordance with WSDOT M41-10, Section 2-03.3(14)D.

3.3.1.3 Common: Compact common fill in 0.3 meter (1 foot) lifts by 2 passes of a vehicle with large rubber tires or tracks, or similar approved method.

3.3.1.4 Underground piping trenches

a. Bedding placed beneath utility lines in trenches shall be material meeting the requirements of Paragraph 2.1.11.

b. Place and compact bedding in trench prepared according to subparagraph 3.2.2.1 before laying utility lines. Compact bedding as specified for structural backfill.

c. Place backfill over joints in pipes only after pressure testing of line has been completed.

d. Backfill under conduit, pipe, and haunches of pipe; around sides; and one foot minimum above top of pipe or conduit with bedding material. Place and compact material same as specified for structural backfill. Compact with care, to avoid misalignment of pipe and provide uniform bearing along barrel of pipe.

e. In graveled roadways and other thoroughfares, under barrier, and within 3 meters of poles and structures, backfill utility trenches from elevation 0.3 meters above top using structural backfill. See subparagraph 3.3.1.2. At other locations use common fill from elevation 0.3 meter above top.

f. Do not allow heavy construction equipment to pass over buried lines until at least 0.6 meter of backfill has been placed over line or until bridging has been placed across trenching and approved by KEH.

3.3.2 Place subgrade fill using a sandy soil borrow meeting 2.1.2 and compact per 3.3.1.2.

3.3.3 Top Course: Place and compact crushed top course in accordance with WSDOT M41-10, 4-04.3(5).

3.3.3.1 Excavate basin in top course and sandy soil for pan lysimeter according to Drawings.

3.3.4 Drainage gravel: Place drainage gravel according to Drawings. Compact with 2 passes of a vibratory plate compactor or roller.

3.3.5 Fractured Basalt: Place basalt as shown on the Drawings. Consolidate with a minimum of 2 passes of a tracked vehicle.

3.3.5.1 Level surface of basalt with shoulder ballast to the finished contours and elevations as shown on Drawings.

3.3.6 Gravel Filter: Place gravel filter over shoulder ballast and drainage gravel according to Drawings. Compact horizontal surfaces (slopes of 0 to 6 percent) in accordance with WSDOT M41-10, 4-04.3(1,3,4,5,7).

3.3.7 Clean Fill: Place clean fill dike material (pit run gravel meeting the requirements of Paragraph 2.1.3) as shown on the Drawings. Compact in accordance with 3.3.1.3.

3.3.8 Sand Filter: Place sand filter over all inner surfaces according to Drawings. Compact horizontal surfaces (slopes 0 to 10 percent) in accordance with subparagraph 3.3.1.2.

3.3.8.1 After placement and compaction, protect sand filter by covering surface with a geotextile.

3.3.9 Lower Silt Layer: Place one meter of silt over geotextile as shown on Drawings. Unload silt in piles and shape with a bulldozer moving

the silt onto the geotextile in a single lift. Maintain a minimum of 0.8 meter of cover between geotextile and bulldozer tracks. Do not drive any vehicle with tires on silt.

3.3.9.1 Rip lower layer of silt to a nominal depth of 0.6 meter (2 feet) to break up any compaction (greater than 88% of maximum dry density) caused during placement. Moisture content in place shall not exceed 10% by weight.

3.3.10 Upper Silt Layer (Admixture): Place one meter of admixed silt by dumping from top of the clean fill dike and shaping with a bulldozer pushing the silt into place. Use ripping to break up any compaction greater than 88% of maximum dry density. Moisture content in place shall not exceed 10% by weight. Do not drive any vehicle with tires on admixed silt.

3.3.11 Perimeter Erosion Barrier: Place lift of base course to prevent run-off erosion around the top perimeter of the barrier. Place, level, and compact using standard road construction equipment in accordance with WSDOT M41-10, 4-04.3(5).

3.3.12 Roads and Parking Area

3.3.12.1 Grade and compact access roads and parking area/turn around in accordance with WSDOT M41-10, 2-06.3(1). Access roads shall be minimum 5.5 meters (18 feet) in width and graded to a maximum of ±10 percent slope with changes in grade to be maximum 1 percent in 2 meters as shown on the Drawings.

3.3.12.2 Uniformly cover access roads and parking area/turn around with 100 mm minimum of crushed surfacing meeting Paragraph 2.1.7 and in accordance with WSDOT M41-10, 4-04.3.

3.3.13 Test Pad: Construct foundation for test pad of asphaltic concrete using the same subgrade preparation, materials, methods, equipment, and procedures as those used for construction of the prototype barrier.

3.4 FIELD QUALITY CONTROL

3.4.1 Material Compaction Tests: Sampling and testing of compacted fill and backfill will be performed by KEH.

3.4.2 Material Testing: Contractor shall determine conformance of borrow site materials to this Specification. Submit material test report to KEH. Operating Contractor may also verify compliance using a mobile laboratory. Acceptance inspection will be performed by KEH.

3.4.3 Testing will be provided by the Construction Quality Assurance (CQA) Engineer and will be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

SOIL COMPACTION PROCEDURE

A	Project Number	Project Title	Date
	Contract Number	Procedure Number	Location of Demonstration

REQUIREMENTS	EQUIPMENT DEMONSTRATED
Applicable Spec./Dwg.	Type
Compaction Required %	Manufacturer
Maximum Lift Size	Model

B LABORATORY SOIL TEST RESULTS

☐ Non-granular Materials (WSDOT Test Method No. 609) Maximum Density _____ Moisture % _____

☐ Granular Materials (WSDOT Test Method No. 606-A) ☐ Density Chart Attached

☐ In-Situ Density _____

C COMPACTION DEMONSTRATION TEST RESULTS

Formula for Percent Compaction: $\frac{\text{dry density}}{\text{max density}} \times 100 = \text{Percent Compaction}$

No. of Passes	Depth of Lift	Percent Moisture	Lbs/ft³ Dry	Maximum Density	Percent Compaction	Accept	Reject

Observations or Comments

SAMPLE

TEST METHOD USED FOR DEMONSTRATION ☐ Nuclear Gage (ASTM D2922 & D3017) ☐ Other _____

D	Contractor Representative	Date
	Engineer/Constructor Inspector	Date

KEH-0382.00 (03/89)

INSTRUCTIONS

This Soil Compaction Procedure form, when approved by the Engineer/Constructor Inspector, documents witnessing and verifying the compaction procedure.

Section A is the responsibility of the Construction Contractor. It is to be completed at the time of backfill compaction demonstration and presented to the Engineer/Constructor Inspector.

Section B is completed by the Engineer/Constructor Inspector. Data entered is obtained from the agency or individual that performed testing.

Section C is completed by the Engineer/Constructor Inspector as the demonstration is performed. Using the applicable formula, the percent compaction achieved is determined and entered. Acceptance is based on the results as compared with the compaction percent required in Section A.

Section D is signed and dated by the Construction Contractor Representative acknowledging responsibility for this procedure and compliance thereto for applicable backfill operations. Section D is signed and dated by the Engineer/Constructor Inspector to signify witnessing and verification.

KEH-0382.00R (03/89)

END OF SECTION

SECTION 02514

ASPHALTIC CONCRETE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

C 136-84a	Standard Method for Sieve Analysis of Fine and Coarse Aggregates
C 294-86 (1991)	Standard Descriptive Nomenclature for Constituents of Natural Mineral Aggregates
C 295-90	Standard Guide for Petrographic Examination of Aggregates for Concrete

1.1.1.2 Washington State Department of Transportation (WSDOT)

M 41-01(CN)-92	Construction Manual
M 41-10-91	Road, Bridge, and Municipal Construction
M 46-01-88	Materials Branch Laboratory Manual

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required

1.2.1.1 Placing and Compaction Procedure: Before beginning work, submit proposed procedure defining methods used during placing, spreading, and compacting to ensure requirements of Paragraph 3.2.1 are met. Include type and size of equipment used.

1.2.2 Approval Not Required

1.2.2.1 Laboratory reports: With delivery, submit laboratory reports for following.

a. Proposed aggregate source will produce gravel classified as igneous or metamorphic rock in accordance with ASTM C 294. Examine aggregate in accordance with ASTM C 295.

b. Aggregate meets the requirements of Paragraph 2.1.2.

c. Liquid asphalt meets the requirements of Paragraph 2.1.1 with submittal required for each load delivered.

1.2.2.2 Handling procedure: Submit proposed procedure defining methods used for delivering, storing, and handling to ensure that requirements of Paragraph 1.3.1 are met.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Aggregate for Asphaltic Concrete Layer

1.3.1.1 Construct stockpiles in accordance with WSDOT M41-10, Section 3-02.2(6).

1.3.1.2 Remove aggregate from stockpiles in accordance with WSDOT M41-10, Section 3-02.2(7).

1.3.2 Handling equipment shall meet the requirements of WSDOT M41-10, Section 5-03(2).

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Asphalt: Meet the requirements of WSDOT M41-10, Section 9-02.1(4), Grade AR-4000W.

2.1.2 Aggregate: Composed of crushed stone or gravel aggregates classified in ASTM C 294 as igneous rock, and meeting the following requirements.

2.1.2.1 Aggregate production: In accordance with WSDOT M41-10, Section 3-01.

2.1.2.2 Grading in accordance with ASTM C 136.

a. Percents finer by weight than each laboratory sieve.

Nominal Square Opening Sieve Size	Aggregate Percent	Tolerance Limits
16 mm (5/8 in.)	100	100
13 mm (1/2 in.)	92 to 100	85 to 100
10 mm (3/8 in.)	85 to 95	80 to 100
4.76 mm (No. 4)	65 to 75	60 to 80
1.19 mm (No. 16)	36 to 42	34 to 46
0.59 mm (No. 30)	27 to 33	25 to 35
0.3 mm (No. 50)	16 to 22	14 to 24
0.074 mm (No. 200)	6.0 to 10.5	5.0 to 11.0

b. Deleterious materials: Particles of specific gravity less than 1.95, maximum 1 percent by weight.

c. Limits for fractured faces by percent weight: Minimum of 2 fractured faces on 85 percent and at least one fractured on 90 percent of material retained on No. 10 and above sieves, as determined by WSDOT M46-01 Test Method No. 103.

2.1.3 Mineral Filler: In accordance with WSDOT M41-10, Section 9-03.8(5).

2.1.4 Crack Sealant: Defined in WSDOT M41-10, Section 9-04.10.

2.2 MIXES

2.2.1 Proportions

2.2.1.1 Size, grade, and quantity of materials, when proportioned and mixed, shall produce a mixture meeting the following requirements.

a. Asphalt: 7.5 percent, ± 0.5 percent by weight of total asphalt mixture. Determination of asphalt content will be in accordance with WSDOT Test Method No. 711.

2.2.2 Mixing

2.2.2.1 Asphalt mixing plants: Meet the requirements of WSDOT M41-10, Section 5-04.3(1).

2.2.2.2 Mix asphaltic concrete in accordance with WSDOT M 41-10, Section 5-04.3(8) and the following requirements.

a. Remove aggregates from stockpiles to ensure minimum segregation when being moved to plant for processing into final mixture.

b. Heat aggregates to a minimum of 121°C (250°F) and a maximum of 177°C (350°F).

c. Heat AR-4000W asphalt to minimum 107°C (225°F) and maximum 176°C (350°F). Heat to avoid local overheating and provide continuous supply of material to mixer.

d. Asphalt wet mixing time: Sufficient to produce 95 percent coated particles determined by WSDOT M46-01, Test Method No. 714.

e. Mix temperature: Not to exceed 163°C (325°F) at batch plant.

f. Asphalt from each specific source or supplier shall not be blended or mixed with other asphalt sources or suppliers.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Surfaces for asphalt: Prepare lift or layer interfaces in accordance with WSDOT M41-10, Section 5-04.3(5)A as directed by KEH.

3.2 INSTALLATION

3.2.1 Place asphaltic concrete as shown on Drawings.

3.2.1.1 Equipment

a. Asphalt pavers shall be in accordance with WSDOT M 41-10, Section 5-04.3(3).

b. Rollers shall be in accordance with WSDOT M41-10, Section 5-04.3(3), with exception only for steel wheeled vibratory type.

c. The equipment used for hauling, placing, spreading, and compacting shall be clean prior to handling asphaltic material.

3.2.1.2 Spreading and Finishing: The material shall be spread and finished in accordance with WSDOT M 41-10, Section 5-04.3(9).

3.2.1.3 Each course of asphalt not to exceed nominal 100 mm (4 inches) loose measurement.

3.2.1.4 Compact until acceptable consolidation is achieved according to WSDOT M41-10, Section 5-04.3(10)A.

a. It is anticipated that the desired compaction can be obtained for design mix with 4 to 6 passes of double drum, vibratory, steel roller weighing at least 7260 kilograms (8 tons).

b. Acceptable level of compaction shall be a minimum of 96 percent of maximum density determined by WSDOT M46-01 Test Method 705.

3.2.1.5 Longitudinal joints in each successive course of asphalt shall be offset a minimum of 1.5 meters from the prior course. Place joints only at locations shown on Drawings and in accordance with WSDOT M 41-10, Section 5-04.3(11).

3.2.1.6 Surface Smoothness: Smoothness of surface shall be in accordance with WSDOT M 41-10, Section 5-04.3(13).

3.2.1.7 Weather Limitations: Place asphaltic concrete following weather limitations as outlined in WSDOT M 41-10, Section 5-04.3(16).

3.2.2 Test Pad

3.2.2.1 Construct test pad of asphaltic concrete using the same materials, methods, equipment, and personnel used to construct the asphaltic concrete layer of the prototype barrier.

3.2.2.2 Construct test pad during same time as placement of asphaltic concrete layer in barrier.

3.4 FIELD QUALITY CONTROL

3.4.1 Sampling and testing of asphaltic concrete pavement will be performed by KEH.

3.4.1.1 Basis of material acceptance sampling will be similar to WSDOT M 41-01(CN), Section 9-5.4.

3.4.2 Testing will be provided by the CQA Engineer and will be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

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SECTION 02650

PIPED UTILITIES

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society of Mechanical Engineers (ASME)

B31.9-1988 w/Addenda A	Building Service Piping

1.1.1.2 American Society for Testing and Materials (ASTM)

A36/A36M-91	Standard Specification for Structural Steel
A 53-90b	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A 123-89a	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A 234-92a	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
D 2241-89	Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
D 2672-89	Joints for IPS PVC Pipe Using Solvent Cement
D 2774-72	Underground Installation of Thermoplastic Pressure Piping

1.1.1.3 American Welding Society

D1.1-92	Structural Welding Code-Steel

1.1.1.4 Federal Specifications (FS)

WW-C-00540C INT AMD 1	Conduit, Metal, Rigid: And Coupling, Elbow, And Nipple, Electrical Conduit: Aluminum

1.1.1.5 International Association of Plumbing and Mechanical Officials (IAPMO)

UPC	Uniform Plumbing Code, 1991

1.1.1.6 Washington State Department of Transportation (WSDOT)

M 41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required

1.2.1.1 Leak/pressure test procedures: Before testing, submit procedures outlining proposed methods of testing joints in piping systems.

1.2.2 Approval Not Required: None.

1.3 QUALITY ASSURANCE

1.3.1 Product Acceptability: See Section 01400, Article 1.4 for required measures to prevent the use of misrepresented products.

1.3.2 Deliverable Documentation: The following documents and records, required by this Section, shall be delivered to KEH in accordance with Section 01720.

Document	Paragraph
Leak/Pressure Test Certification	3.2.1.2
Neutron Probe Access Tube As-Builts	3.2.7.1
Neutron Probe Access Tube As-Builts	3.2.7.2

PART 2 - PRODUCTS

2.1 SUBSTITUTES: Refer to Section 01630 for substitution approvals.

2.2 MATERIALS

2.2.1 Pipe and Fittings

2.2.1.1 Piping and fittings shall meet the requirements of pipe codes in this Section and details on the Drawings.

2.2.2 Pipe Joint Sealant for Threaded Joints: Never-Seez "Pure Nickel Special" lubricating compound manufactured by the Crawford Fitting Co, Crane Packing Company "JC-30," or Dow Corning "Moly-Kote."

2.2.3 Neutron Probe Access Tubes: 64 mm (2-1/2 inch) nominal diameter rigid aluminum conduit and fittings meeting the requirements of FS WW-C-00540.

2.2.4 Neutron Probe Tube Encasement: PVC meeting the requirements of ASTM D 2241, SDR 21 or lower.

2.2.5 Miscellaneous Encasement: Steel pipe defined in ASTM A 53, size shown on Drawings.

2.2.6 Rolled Steel Shapes, Plates, and Bars

2.2.6.1 Galvanized angle iron in accordance with ASTM A 36.

2.2.7 Water Volume Siphons: 150 mm dosing siphons (PVC), Model 624 by Orenco Systems, Inc. or approved substitute.

2.2.7.1 Dose cycle counter: Siphon Sitter by Orenco Systems, Inc. or approved substitute.

2.2.8 Welding Electrodes: E60XX or E70XX.

2.2.9 Zinc-Rich Coating: Galvicon manufactured by Southern Coating Inc. or ZRC manufactured by ZRC Products Co.

PART 3 - EXECUTION

3.1 FABRICATION

3.1.1 Galvanizing: Galvanize collector pipe offsets after fabrication, by hot-dip process in accordance with ASTM A 123. Coating shall be at least 2.8 ounces of zinc for each square foot of surface.

3.1.2 Apply minimum two coats zinc-rich coating to weld-affected areas of galvanized angle iron.

3.2 INSTALLATION

3.2.1 General

3.2.1.1 Install piping and piping accessories in accordance with the UPC, the Pipe Codes, the Drawings, and this Section.

3.2.1.2 Keep piping systems clean during work. Once fabrication has started on length of pipe, plug or cap open ends when installation is not in progress to prevent entry of dirt and other foreign material.

3.2.1.3 For piping excavation and backfill see Section 02200.

3.2.2 Carbon Steel Pipe

3.2.2.1 After cutting, ream pipe to nominal inside diameter. Remove burrs from mating threads in threaded piping before assembly.

3.2.2.2 Weld piping in accordance with ASME B31.9.

3.2.3 PVC piping shall be installed in accordance with ASTM D 2774.

3.2.4 Steel Shapes, Plates, and Bars

3.2.4.1 Fabricate angle iron gutters for water collection system and subsidence post as shown on Drawings.

3.2.4.2 Perform welding of steel connections in accordance with AWS D1.1.

3.2.4.3 Weld piping to angle iron gutter according to Paragraph 3.2.2.2.

3.2.5 Water Volume Siphons

3.2.5.1 Install vaults and siphons according to Drawings.

3.2.5.2 Fill area in bottom of each vault around siphon trap with concrete to form block 300 mm minimum thickness. See Section 03300.

3.2.5.3 Coat inside of siphon, vault with Perma-Guard III in accordance with manufacturer's instructions. Allow 3 days to cure before filling vaults.

3.2.5.4 Fill siphons and vaults with water. Cycle siphons a minimum of 3 times. Calibrate and document each siphon's discharge volume (anticipated to be approximately 180 gallons/cycle) by measuring inflow or outflow between each cycle. Accuracy of calibration shall be ±5 gallons. Fill rate shall be a maximum of 30 gallons per minute.

3.2.6 Flushing

3.2.6.1 Obtain written method for disposal of flushing water from KEH.

3.2.6.2 After installation and before pressure testing completed system, flush piping with water until effluent is clean and contains no visible particulate matter. In all cases flush for minimum of one minute.

3.2.6.3 Perform leak/pressure testing in accordance with Paragraph 3.3.1.

3.2.7 Neutron Probe Access Tubes

3.2.7.1 Install loop-shaped lower access tubes for neutron probes in sandy soil fill according to Drawings. Document location of each joint for as-built information. Deliver documentation to KEH prior to placement of asphaltic concrete.

a. Place 10 mm, braided nylon cord through length of each access tube.

3.2.7.2 Trench and install encasement and upper neutron probe access tubes in basalt, clean fill, and lower silt layers as shown on Drawings. Document location of each joint for as-built information. Deliver documentation to KEH prior to placement of upper silt layer.

a. Place 10 mm, braided nylon cord through length of each access tube.

3.3 FIELD QUALITY CONTROL

3.3.1 Hydrostatic Testing

3.3.1.1 Furnish instruments, facilities and labor required to conduct tests.

3.3.1.2 Document leak/pressure testing of each piping system on "Leak/Pressure Test Certification" Form KEH-1757.

3.3.1.3 Perform leak tests in presence of KEH unless otherwise instructed in writing.

3.3.1.4 Perform tests after lines have been flushed and before backfilling.

3.3.1.5 Before applying test pressure to piping, install necessary restraining devices to prevent distortion or displacement of piping.

3.3.1.6 Verify air has been expelled from piping before applying hydrostatic pressure.

3.3.1.7 Test piping for at least 30 minutes with no visible leaks. Repair detectable leaks, re-examine by same test method originally prescribed and retest.

3.3.1.8 Remove water upon completion of hydrostatic test.

3.3.1.9 Use test pressures shown on the Pipe Codes.

3.3.2 Test piping of water collection system in accordance with WSDOT M 41-10, Section 7-17.3(4)B, except maximum leakage rate shall be 0.10 gph per 100 feet of pipeline.

3.3.3 Testing Neutron Probe Access Tubes

3.3.3.1 After installation and placement of all fill, clear lower neutron probe access tubes with a 50 mm (2 inch) mandrel. Clear tubes before placement of asphalt.

3.3.3.2 After installation and ripping of lower silt layer, clear upper neutron probe access tubes with a 50 mm (2 inch) mandrel. Clear tubes before placement of upper silt layer.

3.3.4 Testing will be provided by the CQA Engineer and will be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

PIPE CODE A			
Service	Max Operating Pressure	Test Pressure	Max Operating Temp
Water Collection System	Atmospheric	3 meters (10 ft) H_2O	49°C (120°F)
Sizes	75 mm (3") and larger		
Pipe	Galvanized steel and black steel in accordance with ASTM A 53.		
Wall Thickness	Schedule 40.		
Fittings	Welded steel in accordance with ASTM A 234.		

PIPE CODE B			
Service	Max Operating Pressure	Test Pressure	Max Operating Temp
Water Collection System	Atmospheric	3 meters (10 ft) H_2O	49°C (120°F)
Sizes	50 mm (2") and larger		
Pipe	Polyvinyl Chloride (PVC) in accordance with ASTM D 2241 SDR 32.5 or lower.		
Joints	Solvent cement in accordance with ASTM D 2672 unless noted otherwise on Drawings.		
Wall Thickness	SDR 32.5 or lower, or Schedule 40.		
Fittings	Socket type, Schedule 40 in accordance with ASTM D 2466.		
Valves	Ball type, true union, full port PVC body, with socket or female threaded connections. Harrington Plastics No. 203E-030 or 203F-030.		

KAISER ENGINEERS HANFORD	LEAK/PRESSURE TEST CERTIFICATION	Report No.	Page 1 of 2

Project or W.O. No.	Title	Dwg. Reference	Test Procedure/Rev.

Construction Spec./Rev.	Code or Standard	Year	Addenda	Class	Stamp Required
					☐ Yes ☐ No

Description of System or Component(s) Test Boundaries

_____

_____

TEST PREPARATION

Notification Requirements

- ☐ Quality Control
- ☐ Acceptance Inspection
- ☐ Safety Engineer
- ☐ Client _____
- ☐ Authorized Inspector
- ☐ _____

Valve Line-up Requirements (for permanent valves installed)

Valve I.D. _____	☐ Open	☐ Close
Valve I.D. _____	☐ Open	☐ Close
Valve I.D. _____	☐ Open	☐ Close
Valve I.D. _____	☐ Open	☐ Close
Valve I.D. _____	☐ Open	☐ Close
Valve I.D. _____	☐ Open	☐ Close

Required Test Medium
Medium _____

Required Test Medium Temp.
Temp. _____

Flushing Requirements
Flushing _____

☐ Blue Chalking Required
☐ Soap Solution Required

Design System Pressure	Design Test Pressure	Specified Hold Time	Prepared By	Date
_____	_____	_____		

PRETEST CHECKLIST

Item or Requirement	Craft Supervision	Quality Control Accept	Quality Control Date
Valve line-up per design requirements (see above line up).			
Flushing of system and/or component completed per design requirements.			
All lines or components not to be tested are properly isolated or disconnected.			
Vents and openings checked; proper Pressure Relief Valve installed and discharge checked.			
Test medium per design requirements; temperature equalized. Medium _____ Medium Temp. _____ (ASME only)			
Test gauge(s) correct range and currently calibrated. SN _____ Range _____ Cal. Due Date _____ SN _____ Range _____ Cal. Due Date _____ SN _____ Range _____ Cal. Due Date _____			
Pressure Relief Valve properly set and currently calibrated. SN _____ PSI Set _____ Checked Date _____ SN _____ PSI Set _____ Checked Date _____ SN _____ PSI Set _____ Checked Date _____			

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KAISER ENGINEERS HANFORD	LEAK/PRESSURE TEST CERTIFICATION	Report No.	Page 2 of 2

TEST PERFORMANCE

Item or Requirement	Quality Control Accept	Quality Control Date
RDT/NE and other if specified:		
50% Tp obtained and examination conducted = Tp _____		
Pressure increments at 0.10 Tp: = Tp _____		
= Tp _____		
= Tp _____		
= Tp _____		
= Tp _____		
Hydrostatic testing - areas to be inspected chalked prior to application of pressure.		
Hydrostatic testing - examination conducted while system/component pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.		
Pneumatic Testing - soap solution applied to areas to be tested and system/components examined while pressurized. Specified Tp _____ PSI obtained at _____ a.m. p.m.		

Pressure Test ☐ Accepted ☐ Rejected	Quality Control Signature	Stamp or PR No.	Date

INSPECTION VERIFICATION

Documentation properly prepared. ☐ Yes ☐ No		Actual Tp during final inspection _____ PSI	
All joints and welded attachments to pressure retaining components chalked/soaped as applicable. ☐ Yes ☐ No		Specified hold time verified at _____ a.m. p.m.	
All joints and welded attachments to pressure retaining components visually inspected for leakage. ☐ Yes ☐ No			
Pressure Test ☐ Accepted ☐ Rejected	Acceptance Inspection Signature	Stamp or PR No.	Date

OTHER

Comments

_____

_____

_____

_____

NCR No. (if applicable)	Client Representative		Date
	Witness - ASME Authorized Inspector		Date
☐ Document Reviewed ☐ Drawings Highlighted	Construction Engineering	PR No.	Date

☆ GPO 1990—794-943

KEH-1757.02 (2/88)

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SECTION 02750

GEOSYNTHETICS

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 413-82 (1988)	Standard Test Methods for Rubber Property--Adhesion to Flexible Substrate
D 751-89	Test Methods for Coated Fabrics
D 1149-91	Test Method for Rubber Deterioration -- Surface Ozone Cracking in a Chamber
D 2136-84 (1989)	Test Method for Coated Fabrics -- Low-Temperature Bend Test
D 3776-85 (1990)	Standard Test Methods for Mass Per Unit Area (Weight) of Woven Fabric
D 3786-87	Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting Strength Tester Method
D 4533-85 (1990)	Standard Method for Trapezoidal Tearing Strength of Geotextiles
D 4751-87	Standard Test Method for Determining Apparent Opening Size of a Geotextile

1.1.1.2 Federal Standards (FED STD)

FED-STD-101C, Including CHGS NOT 1, and 2	Test Procedure for Packaging Materials
Method 2065.1	Puncture Resistance and Elongation Test (1/8 Inch Radius Probe Method)

1.2 SUBMITTALS: Not Used.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

1.3.1.1 During shipment and storage, wrap geosynthetic materials in protective covering to prevent damage. Provide label for each package stating name of manufacturer, product type and number, thickness, physical dimensions, and manufacturer's batch code.

1.3.1.2 Examine materials delivered to site for damage. If damaged, set aside and do not use.

1.3.1.3 Identify each unit with label showing manufacturer's standard marking. Do not remove label.

1.3.2 Storage

1.3.2.1 Unload and store with minimum of handling. Damaged and unusable materials shall be removed from site.

1.3.2.2 Do not store materials on ground.

1.3.2.3 Storage area shall be adequate to protect materials from debris, ultraviolet light, and adverse weather. Geosynthetic clay liner shall be kept dry.

1.3.2.4 Geotextile unprotected or exposed to direct sunlight for more than 2 weeks will be rejected.

1.3.3 Handling

1.3.3.1 Handle materials in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 SUBSTITUTES: Refer to Section 01630 for substitution approvals.

2.2 MATERIALS

2.2.1 Geomembrane: The liner shall be of 3-ply, oil resistant membrane (such as EcoSeal by Burke Environmental Products). The membrane shall be manufactured by calendaring, with each ply of synthetic rubber laminated to the next ply through the openings in the supporting fabric. The open-weave supporting fabric shall have a 16x8 strands per inch, 2:1 leno weave 250 warp/500 fill denier (8x8-500d apparent) construction. The single ply of supporting fabric shall be totally encapsulated by the 2 plies of rubber. Procure from manufacturer in single sheet. Material shall meet the following requirements.

Property	Test Method	Specifications
Ply Adhesion	ASTM D 413 (Type A)	8 lb/inch width, minimum
Cold Bend	ASTM D 2136 (1/8 inch Mandrel)	4 hrs at 0°F, no cracks
Bonded Seam Strength	ASTM D 751	110 lb, minimum
Ozone Resistance	ASTM D 1149 1/8 inch bent loop 100 pphm at 104°F, for 7 days.	No cracks visible under 7X magnification
Tensile Properties Breaking Strength:	ASTM D 751, Grab Method	110 lb minimum
Elongation at Break	ASTM D 751	100 percent minimum
Tear:	ASTM D 751, Tongue Tear Method	12 lb minimum
Puncture Resistance:	FTMS 101C (Method 2065.1)	140 lb minimum
Hydrostatic Resistance:	ASTM D 751, Method A	135 psi minimum
Thickness:	ASTM D 751	
Nominal		35 mil
Minimum		30 mil

2.2.1.1 Joint Sealant: Lap or boot sealant shall be as recommended by manufacturer of sheeting.

2.2.2 Nonwoven Geotextile: Use a non-woven, needle-punched polypropylene geotextile. Geotextile shall meet the following requirements.

Property	Test Method	Specifications
Mass per Unit Area	ASTM D 3776	10 oz/yd^2 minimum
Tear Strength (minimum trapezoidal)	ASTM D 4533	90 lbs in any principal direction
Mullen Burst	ASTM D 3786	450 psi minimum
Apparent Opening Size (AOS), US Standard Sieve	ASTM D 4751	120 maximum

2.2.3 Geosynthetic Clay Liner (GCL): Sodium bentonite geocomposite, 6 millimeters (1/4 inch) minimum thickness, 3.7 meters (12 feet) minimum width.

2.2.3.1 Bentonite: 4.64 kg per square meter evenly distributed and securely fixed in place on geosynthetic backing material, 70% minimum sodium montmorillonite as determined by the methylene blue test.

2.2.3.2 Representative products: Bentofix NS by Albarrie Naue Ltd., Claymax 200R by James Clem Corp., and Bentomat by Colloid Environmental Technologies Co.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Maintain surfaces in smooth and uniform condition to receive geosynethics. Repair damaged surfaces prior to installation of geosynthetics.

3.2 INSTALLATION

3.2.1 Geotextile: Install in accordance with the drawings and the manufacturer's recommendations. Unroll, position, and smooth wrinkles and folds. Anchor geotextile temporarily to prevent wind damage until covering materials are installed.

3.2.1.1 Install geotextile on surface lapping seams a minimum of 0.3 meter. No horizontal seams will be allowed on slopes.

3.2.2 Geomembrane: Cover the first geotextile in the pan lysimeters with a single sheet of prefabricated geomembrane. No field seams are allowed. Install in accordance with drawings and manufacturer's recommendations. After placement of the GCL over the first geomembrane layer, place second sheet of geomembrane using the same methods.

3.2.2.1 Unroll, position, and smooth out unwanted folds and wrinkles. Fold in designated locations to fit geomembrane to the contours of the lysimeter basins. Anchor geomembrane and folds temporarily to prevent wind damage until material is secured.

3.2.3 Geosynthetic Clay Liner: Place GCL between layers of geomembrane as shown on the drawings and in accordance with the manufacturer's recommendations.

3.2.3.1 Remove all folds and wrinkles. Fit GCL to lysimeter basins by cutting along fold lines and seaming. Lap all seams a minimum of 0.3 meter.

3.2.3.2 Protect GCL from precipitation until installation of top geomembrane is complete. Surfaces to receive GCL shall be dry. Do not leave exposed overnight.

3.2.3.3 Remove and replace damaged GCL.

3.2.4 Geomembrane Repairs: If geomembrane is defective or damaged during shipping, storage, handling, or placement, replace with undamaged sheet. If damaged after placement, repair damaged areas by applying piece of sheeting, sufficient in size to extend approximately 76 mm beyond damaged area. Round corners to minimum 76 mm radius and install using materials and procedures used in making field joints.

3.2.5 Geotextile Repairs: Make repairs in accordance with manufacturer's recommended procedures. Lap material a minimum of 0.3 meter.

3.2.6 GCL Repairs: Make repairs in accordance with manufacturer's recommendations.

3.3 FIELD QUALITY CONTROL

3.3.1 Examination and Acceptance: Examine entire surfaces of geosynthetics and check for following.

3.3.1.1 Complete coverage of materials over specified areas.

3.3.1.2 Tears, punctures, thin spots and other damage or defects.

3.3.1.3 Proper overlap of material for seams.

3.3.2 Testing will be provided by the CQA Engineer and shall be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

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SECTION 02779

FLUID APPLIED ASPHALT

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 American Society for Testing and Materials (ASTM)

D 36-86 (1989)	Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
D 70-82 (1990)	Test Method for Specific Gravity and Density of Semi-Solid Bituminous Materials
D 217-88	Test Method of Cone Penetration of Lubricating Grease
E 102-81 (1987)	Test Method for Saybolt Furol Viscosity of Bituminous Materials at High Temperatures

1.2 SUBMITTALS: Refer to Section 01300 for submittal procedures.

1.2.1 Approval Required: None.

1.2.2 Approval Not Required

1.2.2.1 Laboratory reports: With delivery, submit laboratory reports for following.

a. Softening point meeting the requirements of ASTM D 36.

b. Specific gravity meeting the requirements of ASTM D 70.

c. Cone penetration meeting the requirements of ASTM D 217.

d. Viscosity meeting the requirements of ASTM E 102.

e. Type and percent of modifiers by weight.

PART 2 - PRODUCTS

2.1 SUBSTITUTES: Refer to Section 01630 for substitution approvals.

2.2 MATERIALS

2.2.1 Fluid Applied Asphalt: Use styrene-butadiene modified asphalt having the following properties.

Property	Test Method	Specifications
Softening Point	ASTM D 36	79.4-93.3°C (175 - 200°F)
Specific Gravity	ASTM D 70	1.05 - 1.1 at 15.6°C (60°F)
Cone Penetration	ASTM D 217	50 - 80 x 10 -1mm at 25°C (77°F)
Viscosity	ASTM E 102	600 - 1100 SSF at 177°C (350°F)
Flow		0.5 cm maximum at 60°C (140°F) at 75 degree angle
Pliability		No cracks to pass, (-)17.8°C (0°F), bend around 1.27 cm radius rod
Service Temperature		(-)40 to 82°C (-)40 to 180°F)
Compatibility with asphalt		Complete

2.2.2 Representative Product: Gilsabind by Deery Oil Co or approved substitute.

PART 3 - EXECUTION

3.1 INSTALLATION

3.1.1 After asphaltic concrete layers are placed, apply fluid applied asphalt to asphaltic concrete surface.

3.1.1.1 The asphaltic concrete shall be free of any debris or moisture before each application.

a. The surface shall be blown clean as directed by KEH.

3.1.1.2 Fluid applied asphalt shall be applied from spray nozzles mounted on an asphalt distributor truck. Application temperature shall be between 143°C (290°F) and 200°C (390°F). The total thickness shall be 200 mils minimum applied in two applications of 100 mils minimum each. Delay 24 hours between applications to allow asphalt to cure.

a. The asphalt distributor truck shall be in accordance with WSDOT M41-10, Section 5.02.3(1). Prior to application on asphaltic concrete, operate distributor off barrier to ensure that all nozzles are working uniformly. Material sprayed during this test must be removed from the site by the Contractor.

b. Apply fluid applied asphalt to repair defects or damaged areas with hand spray nozzle from distributor truck or hose and squeegee. Repair first application before applying second.

3.2 FIELD QUALITY CONTROL

3.2.1 Application thickness will be checked by KEH.

3.2.2 Testing will be provided by the CQA Engineer and will be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

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SECTION 02935

SOIL STABILIZATION

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 Reference Standards and Specifications: The following standards and specifications, including documents referenced therein, form part of this Section to extent designated herein.

1.1.1.1 Washington State Department of Transportation (WSDOT)

M 41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Not Used.

1.3 DELIVERY AND STORAGE

1.3.1 Deliver materials to site in undamaged condition. Defective and damaged materials shall be replaced.

1.3.2 Storage: Store materials in dry location protected from weather.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Seed: Meeting the requirements of WSDOT M 41-10, Section 9-14.2 and having a mixture of 25 percent intermediate wheat grass, 25 percent crested wheat grass, 15 percent slender wheat grass, 15 percent big blue grass, 10 percent siberian wheat grass and 10 percent perennial rye grass, by weight.

2.1.2 Straw: Meeting the requirements of WSDOT M 41-10, Section 9-14.4(1).

2.1.3 Fertilizer: Meeting the requirements of WSDOT M 41-10, Section 9-14.3 and shall be controlled release containing either 16 percent nitrogen, 20 percent available phosphoric acid and 20 percent water soluble potash (16-20-20) or 38 percent nitrogen, 0 percent available phosphoric acid, and 0 percent water soluble potash (38-0-0).

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Remove litter, visible rocks, hard lumps, large clods, and debris 6 inches or larger in any dimension.

3.1.2 Smooth and compact soil in accordance with WSDOT M 41-10, Section 8-01.3(1) B.

3.2 INSTALLATION

3.2.1 Stabilize all surfaces disturbed at the silt borrow area, along raw water line, and around the barrier other than travelways. Stabilization is not to be applied to any surface on the prototype barrier.

3.2.1.1 Plant seed, fertilize, and mulch between February 15 and April 15 or September 1 and November 15.

3.2.2 Apply seed at a rate of 60 pounds per acre in accordance with WSDOT M 41-10, Section 8-01.3(4) A.

3.2.3 Apply 16-20-20 fertilizer at 500 pounds per acre or 38-0-0 fertilizer at 100 pounds per acre in accordance with WSDOT M 41-10, Section 8-01.3(4).

3.2.4 Apply straw at a rate of 4000 pounds per acre in accordance with WSDOT M 41-10, Section 8-01.3(5).

3.2.5 Protection and Care: In accordance with WSDOT M 41-10, Section 8-01.3(9).

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 REFERENCES

1.1.1 The following documents, including others referenced therein, form part of this Section to the extent designated herein.

1.1.1.1 American Concrete Institute (ACI)

211.1-89	Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete
301-89	Structural Concrete for Buildings
304R-89	Guide for Measuring, Mixing, Transporting, and Placing Concrete
305R-89	Hot Weather Concreting
306R-88	Cold Weather Concreting

1.1.1.2 American Society for Testing and Materials (ASTM)

C 33-90	Concrete Aggregates
C 94-90	Ready-Mixed Concrete
C 150-89	Portland Cement
C 260-86	Air-Entraining Admixtures for Concrete
C 1107-91	Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

1.1.1.3 Code of Federal Regulations (CFR)

Title 40	Protection of Environment
Part 249	Guideline for Federal Procurement of Cement and Concrete Containing Fly Ash

1.1.1.5 National Ready Mixed Concrete Association (NRMCA)

Certificate of Conformance for Concrete Production Facilities	Certification of Ready Mixed Concrete Production Facilities January 1, 1984 (Fourth Revision)

1.1.1.6 Washington State Department of Transportation (WSDOT)

M 41-10-91	Road, Bridge, and Municipal Construction

1.2 SUBMITTALS: Not Used.

1.3 QUALITY ASSURANCE

1.3.1 Product Acceptability: See Section 01400, Article 1.4 for required measures to prevent the use of misrepresented products.

1.3.2 Deliverable Documentation: The following documents and records, required by the Section, shall be delivered to KEH in accordance with Section 01720.

Document	Paragraph
Trip Tickets	3.2.2.1.b

PART 2 - PRODUCTS

2.1 SUBSTITUTES

2.1.1 See Section 01630 for substitution approvals.

2.2 MATERIALS

2.2.1 Concrete

2.2.1.1 Cement: ASTM C 150, Type II (low alkali). Fly Ash content is allowable in accordance with the recommendations of 40 CFR 249.12 and 249.13.

2.2.1.2 Aggregates: ASTM C 33, 19 mm (3/4 inch) maximum size. 10 mm (3/8 inch) maximum size may be used in gutters at Contractor's option.

2.2.1.3 Air-entraining admixture: ASTM C 260; Sika Chemical Company "SIKA AER", Chem-Masters Corporation "Adz-Air", or Protex Industries "AES".

2.2.1.4 Properties:

a. Minimum allowable compressive strength: 3000 lb/in^2 at 28 days.

b. Maximum slump: 25 mm (1 inch) for machine formed curbing, 100 mm (4 inches) for all others, in accordance with ACI 301, Section 3.5.

c. Air content: In accordance with ACI 301, Table 3.4.1.

d. Proportions: In accordance with ACI 301, Sections 3.8 and 3.9, and ACI 211.1.

2.2.1.5 Measuring: In accordance with ACI 304R.

2.2.1.6 Mixing: In accordance with ASTM C 94, and ACI 304R.

2.2.1.7 Delivery: In accordance with ASTM C 94, and ACI 304R.

PART 3 - EXECUTION

3.1 INSTALLATION

3.2.2 Concrete

3.2.2.1 Before placing:

a. Obtain approval of "Pour Slip" by KEH. "Pour Slip" shall include appropriate reference to specific portion of structure to be placed, maximum size of coarse aggregate, and design strength. "Pour Slip" forms can be obtained from KEH.

b. For each truck load, deliver "Trip Ticket" to KEH. "Trip Ticket" shall contain information listed in ASTM C 94, Paragraphs 16.1.1 through 16.1.10, and the water/cement ratio.

3.2.2.2 Temper only as permitted in ACI 301, Section 7.5.

3.2.2.3 Weather conditions: Protect concrete during placement in accordance with ACI 301, Sections 7.6 and 8.4. Cold weather concreting procedure shall be in accordance with ACI 306R; hot weather concreting procedure in accordance with ACI 305R.

3.2.2.4 Construction joints: Make in accordance with ACI 301, Section 6.1, and as detailed on the Drawings.

3.2.2.5 Placing concrete against asphalt or earthen material: Place on or against firm, damp surfaces free of frost, ice and free water. Dampen surfaces to receive fresh concrete.

3.2.2.6 Before installation of gutters, place concrete curbing as shown on Drawings. Use extruding machine.

3.2.2.7 After gutter insulation, place and form crickets of concrete in gutters by hand. Finish curbing across ends of gutters by hand.

3.2.3 Concrete Repair

3.2.3.1 Place concrete repair mortar within one hour after mixing. Do not retemper mortar.

3.2.3.2 Surface defect repair: Repair in accordance with ACI 301, Sections 9.1, 9.2 and 9.3. Cure concrete repairs same as new concrete.

3.2.4 Concrete Finishes and Tolerances

3.2.4.1 Formed surfaces: Start finishing following concrete repair and complete within 12 hours after concrete is placed. Finish in accordance with ACI 301 sections noted below.

a. Surfaces exposed to earth backfill	Section 10.2.2

3.2.4.2 Unformed surfaces: Finish in accordance with ACI 301 sections noted below.

a. Exterior slabs	Section 11.7.4

3.3 CURING

3.3.1 Cure concrete in accordance with ACI 301, Section 12.2. Clear curing compounds shall be tinted or applied to surfaces marked to delineate extent of spraying.

3.4 FIELD QUALITY CONTROL

3.4.1 Concrete Testing: Sampling and testing of concrete will be the responsibility of KEH. Concrete may be tested to ACI 301, Sections 16.3.4, 16.3.5, 16.3.6 and 16.3.8, and the results recorded.

3.4.2 Testing will be provided by the CQA Engineer and will be performed in accordance with the CQA Plan. The Contractor shall make allowances for sampling and testing by the CQA Engineer in both his production operations and schedule.

3.5 PROTECTION

3.5.1 Protect concrete during extreme weather conditions in accordance with ACI 301, Section 12.3.

3.5.2 Protect concrete from mechanical injury in accordance with ACI 301, Section 12.4.

END OF SECTION

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LY LE FORT
STATE OF WASHINGTON
19854
REGISTERED
PROFESSIONAL ENGINEER

7/16/93

EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE	
DSGN. ENGR	David Ly Le Fort	6/14/93	
CHECKED	Lawrence A Faddis	6/15/93	
SAFETY	D Lundgren	6-15-93	
ENVIR	S D Consort	6/15/93	
QUAL ENGR	S K Fiesion	6-16-93	
LEAD ENGR			
APPROVED FOR IMPLEMENTATION BY	Mark Barker	7/19/93	
FOR	WHC	DATE	

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

DRAWING LIST

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG. NO.	INDEX NO.	DWG. NO.	REV. NO.
F	216-B-57	0110	H-2-817484	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS | APVD FOR IMPL/INC FOR DATE

J:DEC:ACD2:11.0:NN

2 PLOT SCALE 1=1 | KEHCAD 1

KEH 0350.00 (04/92)
STRTKEHF 10920115.0900

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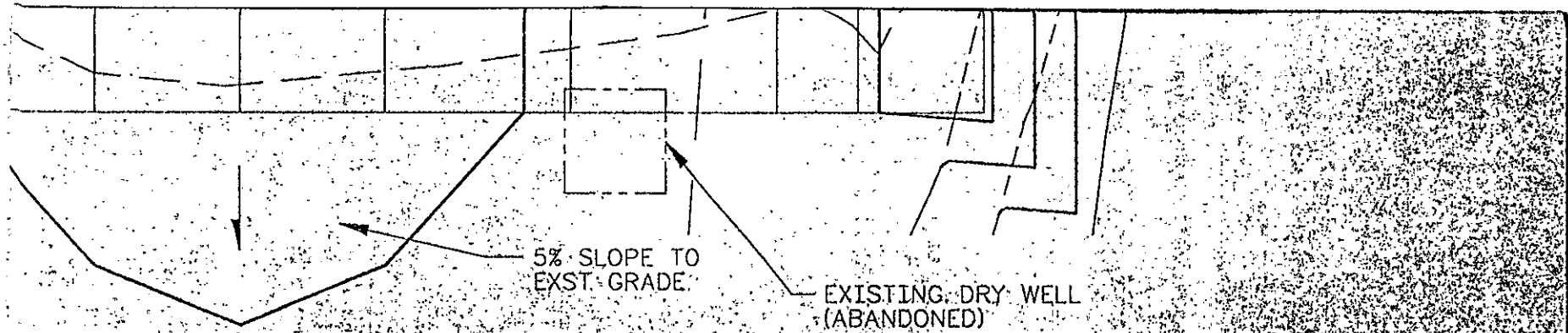


SITE PREP/SUBGRADE FILL

OFFICIAL RELEASE BY WHC DATE JUL 22 1993

DAVID LYLE FORT STATE OF WASHINGTON 19818 REGISTERED PROFESSIONAL ENGINEER
7/16/93
EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE	
DSGN ENGR	David Lyle Fort	6/14/93	
CHECKED	Lawrence Abdalla	6/14/93	
SAFETY	D Thompson	6-15-93	
ENVIR	DD Consort	6/15/93	
QUAL ENGR	B.R. Fulton	6-16-93	
LEAD ENGR			

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
SITE PREP PLAN

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV NO.
F	216-B-57	0110	H-2-817485	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS

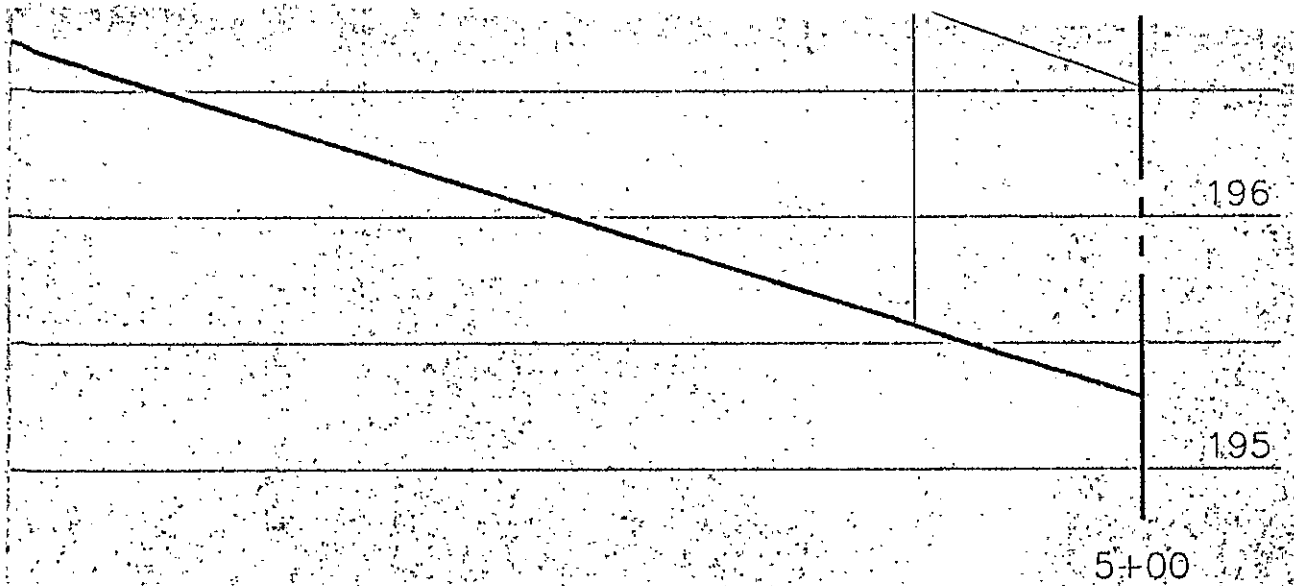
APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark Bishop 7/19/93
FOR WHC DATE

DEC:ACD2:11.0:NN

2 PLOT SCALE 1=1 | KEHCAD 1

KEH 0350.00 (04/92)
STRTKEHF 19920415.0900



OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER

7/16/93

EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE	
DSGN ENGR	David Lyle Fort		6/14/93
CHECKED	Lawrence A Gadbois		6/14/93
SAFETY	D Lundgren		6-15-93
ENVIR	D.D. Consort		6/15/93
QUAL ENGR	B.R. Fullion		6-16-93
LEAD ENGR			

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL PROFILE RAW WATER

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV NO.
F	216-B-57	0110	H-2-817486	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS | APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Matt Bandstra 7/19/93
FOR WHC DATE

J:DEC:ACD2:11.0:NN

2 PLOT SCALE: 1=1 | KEHCAD 1

KEH 0350.00 (04/92)
STRTKEHF: 19920415.0900

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OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER
7/16/93

EXPIRES 10/11/93

A

DESIGNED BA LORENZO	DATE
DSGN ENGR David Lyle Fort	6/14/93
CHECKED Lawrence A. [illegible]	6/14/93
SAFETY D Lundgren	6-15-93
ENVIR S.D. Consort	6/15/93
QUAL ENGR B.R. Fellows	6-16-93
LEAD ENGR	

KEH APPROVALS — APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION BY Mark A. [illegible] 7/19/93 FOR WHC DATE

SAFETY CLASS 3 — EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PROFILE & DETAILS
RAW WATER

PROJECT W-263 PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO	INDEX NO	DWG NO	REV NO
F	216-B-57	0110	H-2-817487	0

SCALE SHOWN — JOB NO ER3412 — SHEET 1 OF 1

J:DEC:ACD2:11.0:NN

KEH 0350.00 (04792)
STRTKEHF 19970415.0900

NTROL LINE (℄ PIPE)

150mm x 90° ELB WITH
150mm x 75mm RDCR BSHG

SIDE
SIDE OPP HAND

OFFICIAL RELEASE
BY WHC
DATE
JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19650
REGISTERED
PROFESSIONAL ENGINEER

David Lyle Fort 6/14/93

EXPIRES 10/11/93

DESIGNED DJ WHITISH	DATE	SAFETY CLASS 3
DSGN ENGR David Lyle Fort	6/14/93	EDT 142535
CHECKED Lawrence Wolfe	6/14/93	
SAFETY D Lundgren	6-15-93	
ENVIR. S.D. Consort	6/15/93	
QUAL ENGR E.R. Fellion	6-16-93	
LEAD ENGR		

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLAN, SECTION & DETAIL
WATER COLLECTION SYSTEM

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV. NO.
F	216-B-57	0110	H-2-817488	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 2

KEH APPROVALS	APVD. FOR IMPL/INC. FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark H. Buckmaster 7/19/93
FOR WHC DATE

2J:DEC:ACD2:11.0:NN

2 PLOT SCALE: 1=1 | KEHCAD 1

KEH 0350.00 (04/92)
STRTKEHF: 19920415.0900

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
1959
REGISTERED
PROFESSIONAL ENGINEER
7/16/93

EXPIRES 10/11/93

DESIGNED DJ WHITISH	DATE	SAFETY CLASS 3	EDT 142535
DSGN ENGR David Lyle Fort	7-16-93		
CHECKED Lawrence Gadbois	7-16-93		
SAFETY L. Leibold	7-16-93		
ENVIR S.D. Consort	7/16/93		
QUAL ENGR BRF by Roger Stallings	7/14/93		
LEAD ENGR			

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLAN, SECTION & DETAIL
WATER VOLUME SYSTEM

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV NO.
F	216-B-57	0110	H-2-817488	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 2 OF 2

KEH APPROVALS

APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark Bunger 7/19/93
FOR WHC DATE

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KEH 0350.00 (04/92)

OFFICIAL RELEASE
BY WHC
DATE
JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER
7/14/93

EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE	
DSGN ENGR	David Lyle Fort	6/14/93	
CHECKED	Laurence A Kelly	6/14/93	
SAFETY	D Lundgren	6-15-93	
ENVIR	S D Consort	6/15/93	
QUAL ENGR	B.R. Fillion	6 16 93	
LEAD ENGR			

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLAN, SECTION & DETAIL
ASPHALTIC LAYER

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV. NO.
F	216-B-57	0110	H-2-817489	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 2

KEH APPROVALS | APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark H. Barker 7/16/93
FOR WHC DATE

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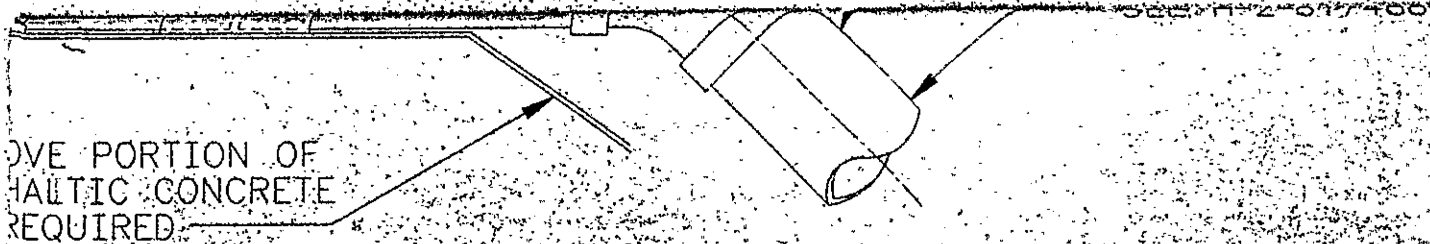
2 PLOT SCALE: 1=1 | KEHCAD 1

KEH 0350.00 (04/92)
STRTKEHF 19920416.0900



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(5) H-2-817489 SH1

DAVID LYLE FORT · STATE OF WASHINGTON · 18859 · REGISTERED PROFESSIONAL ENGINEER
7/16/93
EXPIRES 10/11/93

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DESIGNED BA LORENZO	DATE
DSGN ENGR David Lyle Fort	7-16-93
CHECKED Lawrence [signature]	7-16-93
SAFETY [signature]	7-16-93
ENVIR S.D. Consort	7/16/93
QUAL ENGR [signature]	7/16/93
LEAD ENGR	
KEH APPROVALS / APVD FOR IMPL/ING FOR DATE	
APPROVED FOR IMPLEMENTATION BY [signature] FOR WHC	7/19/93

SAFETY CLASS 3 · EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLAN, SECTION & DETAIL
ASPHALT LAYER DRAINAGE

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV NO.
F	216-B-57	0110	H-2-817489	0

SCALE SHOWN · JOB NO. ER3412 · SHEET 2 OF 2

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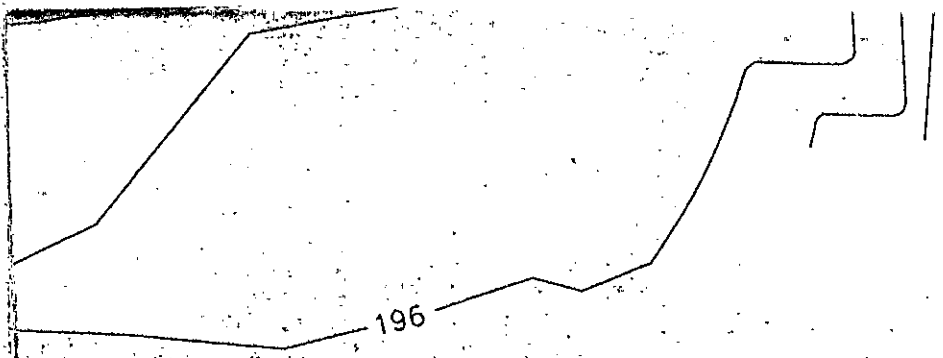
2 PLOT SCALE 1=1 · KEHCAD · 1

KEH 0350.00 (04/92)
STRIKEHF 19920415.0900



ALT PLACEMENT

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER
7/16/93

EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE
DSGN ENGR	David Lyle Fort	6/14/93
CHECKED	Lawrence A Gelb	6/14/93
SAFETY	D Lundgren	6-15-93
ENVIR	S D Consort	6/15/93
QUAL ENGR	B.R. Fullmer	6-16 93
LEAD ENGR		

SAFETY CLASS 3

EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLANS
DRAINAGE & BASALT LAYERS

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

REV NO. 0

SIZE	BLDG NO.	INDEX NO.	DWG NO.
F	216-B-57	0110	H-2-817490

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS

APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark H. Barker 7/19/93
FOR WHC DATE

KEH 0350.00 (04/92)
STRTKEHD 19920415.0900

:DEC:ACD2:11.0:NN

2 PLOT SCALE: 1=1 | KEHCAD | 1

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

DAVID LYLE FORT — STATE OF WASHINGTON — 19859 — REGISTERED PROFESSIONAL ENGINEER

[signature] 7/16/93

EXPIRES 10/11/93

DESIGNED	B.A. LORENZO
DSGN ENGR	David Lyle Fort 7-16-93
CHECKED	[signature] 7-16-93
SAFETY	[signature] 7-16-93
ENVIR	S.D. Consort 7/16/93
QUAL ENGR	[signature] 7/16/93
LEAD ENGR	
APPROVED FOR IMPLEMENTATION BY	[signature] 7/16/93
FOR	WHC

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
PLAN
FILTER & CLEAN FILL LAYERS

PROJECT W-263 – PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV NO.
F	216-B-57	0110	H-2-817491	0

SCALE: SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS | APVD FOR IMPL/INC FOR DATE

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2 PLOT SCALE 1=1 | KEHCAD | 1

KEH-0350.00 (04/92)
STRIKEHF-1992-0415-0900

DMIX) LAYER

OFFICIAL RELEASE
BY WHC
DATE
JUL 22 1993

DAVID LYLE FORT
STATE OF WASHINGTON
15858
REGISTERED
PROFESSIONAL ENGINEER

7/16/93

EXPIRES 10/11/93

DESIGNED	BA LORENZO	DATE
DSGN ENGR	David Lyle Fort	6/14/93
CHECKED	Lawrence Rodda	6/14/93
SAFETY	D Lundgren	6-15-93
ENVIR	S.D. Consort	6/15/93
QUAL ENGR	B.R. Fullerton	6-16-93
LEAD ENGR		

SAFETY CLASS 3

EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL PLANS
LOWER & UPPER SILT LAYERS

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV. NO.
F	216-B-57	0110	H-2-817492	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

KEH APPROVALS

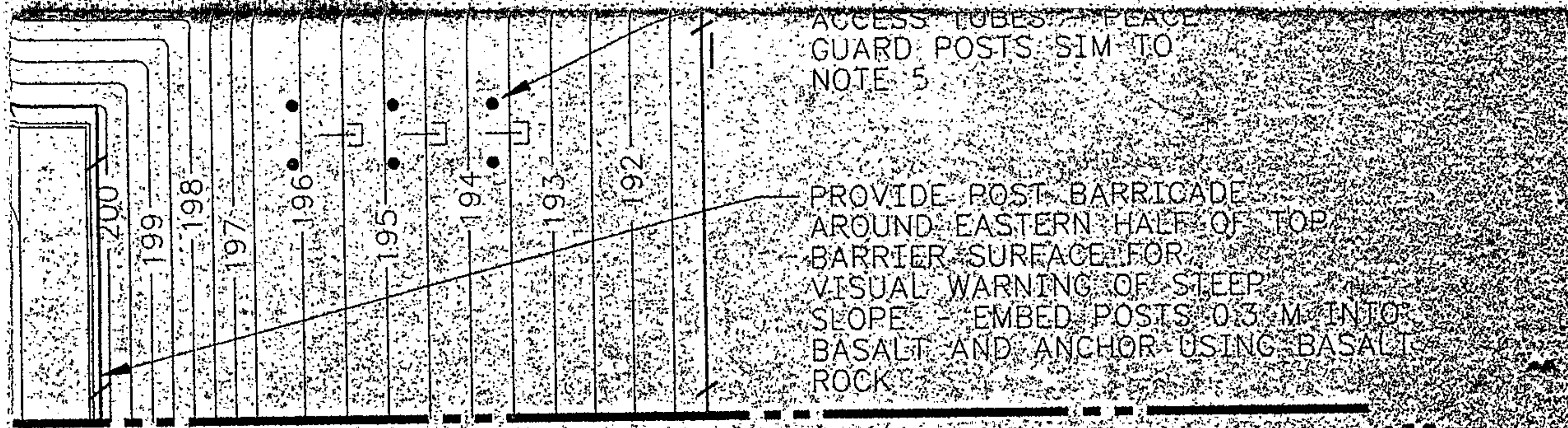
APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION
BY Mark H. Burke 7/19/93
FOR WHC DATE

2J:DEC:ACD2:11:0:NN

2 PLOT SCALE: 1=1 | KEHCAD | 1

KEH 0350.00 (04/92)
STRIKEHF: 19920415.0900



OFFICIAL RELEASE BY WHC
DATE JUL 22 1993

DAVID LYLE FORT — STATE OF WASHINGTON — 19859 REGISTERED PROFESSIONAL ENGINEER
7/16/93
EXPIRES 10/11/93

DESIGNED BA LORENZO	DATE
DSGN. ENGR David Lyle Fort	7-16-93
CHECKED [signature]	7-16-93
SAFETY [signature]	7-16-93
ENVIR S.D. Consort	7/16/93
QUAL. ENGR K. Conrad	7-16-93
LEAD ENGR	

KEH APPROVALS — APVD FOR IMPL. INC. FOR DATE

APPROVED FOR IMPLEMENTATION BY [signature] 7/19/93 FOR WHC DATE

SAFETY CLASS 3 — EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
FINAL PLAN
ROADS, BARRICADES, SIGNS

PROJECT W-263 - PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO.	REV. NO.
F	216-B-57	0110	H-2-817493	0

SCALE SHOWN — JOB NO. ER3412 — SHEET 1 OF 2

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2 PLOT SCALE 1=1 KEHCAD 1 KEH 1150.00 (04/92) STRTKEHF 19920415.0900

B

OFFICIAL RELEASE
BY WHC
DATE
JUL 2 2 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER

7/16/93

EXPIRES 10/11/93

A

DESIGNED BA LORENZO	DATE
DSGN ENGR David Lyle Fort 7-16-93	
CHECKED Lawrence A. [illegible] 7-16-93	
SAFETY [illegible] 7-16-93	
ENVIR S.D. Consort 7/16/93	
QUAL ENGR BRF by [illegible] 7/16/93	
LEAD ENGR	
KEH APPROVALS	APVD FOR IMPL/INC FOR DATE
APPROVED FOR IMPLEMENTATION BY Mark A. [illegible] 7/19/93	
FOR WHC	DATE

SAFETY CLASS 3 | EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
FINAL PLAN
ROADS, BARRICADES, SIGNS

PROJECT W-263 PROTOTYPE SURFACE BARRIER

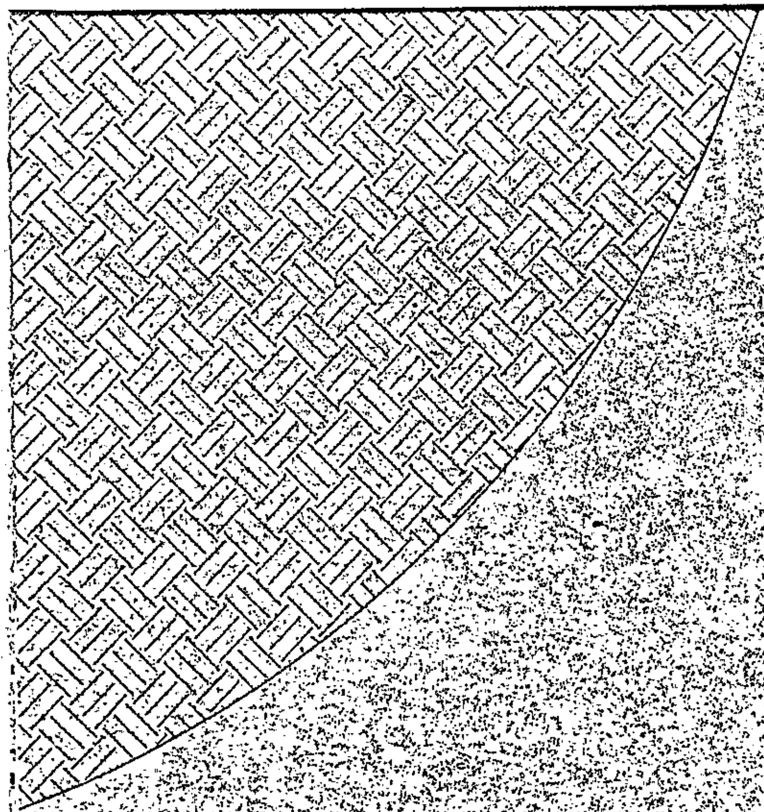
SIZE	BLDG NO	INDEX NO	DWG NO	REV NO
F	216-B-57	0110	H-2-817493	0

SCALE AS SHOWN | JOB NO ER3412 | SHEET 2 OF 2

J:DEC.ACD2.1.1.0.NN

2 PLOT SCALE 1=1 | KEHCAD

KEH 0350.00 (04/92)
STRIKEHF 19920415.0900



OFFICIAL RELEASE
BY WHC
DATE JUL 2 2 1993

DAVID LYLE FORT
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
19659
7/16/93
EXPIRES 10/11/93

DESIGNED BA LORENZO	DATE
DSGN ENGR David Lyle Fort 7-16-93	
CHECKED 7-16-93	
SAFETY 7-12-93	
ENVIR S.D. Conport 7/16/93	
QUAL ENGR BRF 7/16/93	
LEAD ENGR	
APVD FOR IMPL'ZING FOR DATE	KEH APPROVALS
APPROVED FOR IMPLEMENTATION BY Mark H. 7/19/93 FOR WHC DATE	

SAFETY CLASS 3 EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
SECTIONS & DETAILS
BARRIER CROSS SECTION

PROJECT W-263 PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO	INDEX NO	DWG NO	REV NO
F	200BP1 216-B-57	0110	H-2-817494	0

SCALE SHOWN JOB NO ER3412 SHEET 1 OF 1

EG:ACD2-11-0-NN

2 PLOT SCALE 1:1 KEHCAD

KEH 0350.00 (04/92)
STRIKEHF 19920415.0900

LYSIMETER (A)

B

OFFICIAL RELEASE
BY WHC
DATE JUL 2 2 1993

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED
PROFESSIONAL ENGINEER
7/16/93
EXPIRES 10/11/93

A

DESIGNED BA LORENZO DATE	SAFETY CLASS 3	EDT 142535
DSGN. ENGR David Lyle Fort 7-16-93	U.S. DEPARTMENT OF ENERGY RICHLAND FIELD OFFICE KAISER ENGINEERS HANFORD COMPANY	
CHECKED Lawrence [illegible] 7-16-93	CIVIL PLAN & DETAILS ASPHALT TEST PAD, LYSIMETER	
SAFETY [illegible] 7-16-93		
ENVIR S.D. Consort 7/16/93		
QUAL. ENGR BRF by [illegible] 7/16/93		
LEAD ENGR	PROJECT W-263 - PROTOTYPE SURFACE BARRIER	

KEH APPROVALS	APVD FOR IMPL/INC FOR DATE

APPROVED FOR IMPLEMENTATION BY Mark A. [illegible] 7/19/93 FOR WHC DATE

SIZE	BLDG NO.	INDEX NO.	DWG. NO.	REV. NO.
F	216-B-57	0110	H-2-817495	0

SCALE SHOWN | JOB NO. ER3412 | SHEET 1 OF 1

:DEC:ACD2:11:0:NN

KEH-0350.00 (04/92)
STRTKEHF 19920415.0900

2 PLOT SCALE 1=1 KEHCAD 1

B

DAVID LYLE FORT
STATE OF WASHINGTON
19859
REGISTERED PROFESSIONAL ENGINEER
7/16/93
EXPIRES 10/11/93

OFFICIAL RELEASE
BY WHC
DATE JUL 22 1993

A

DESIGNED BA LORENZO	DATE
DSGN ENGR David Lyle Fort	6/14/93
CHECKED Lawrence A. [illegible]	6/14/93
SAFETY D Lundgren	6-15-93
ENVIR S.D. Consort	6/15/93
QUAL ENGR B.R. Fellion	6-16-93
LEAD ENGR	
APPROVED FOR IMPLEMENTATION BY [signature] FOR WHC	DATE 7/19/93

KEH APPROVALS — APVD FOR IMPL/INC FOR DATE

SAFETY CLASS 3 — EDT 142535

U.S. DEPARTMENT OF ENERGY
RICHLAND FIELD OFFICE
KAISER ENGINEERS HANFORD COMPANY

CIVIL
DETAILS
ROAD, SIGNS & ACCESS TUBES

PROJECT W-263 PROTOTYPE SURFACE BARRIER

SIZE	BLDG NO.	INDEX NO.	DWG NO	REV NO.
F	~~200-BP-1~~ 216-B-57	0110	H-2-817496	0

SCALE SHOWN — JOB NO. ER3412 — SHEET 1 OF 1

DEC.ACD2.11.0.NN

KEH 0350.00 (04/92)
STRTKEHF 19920415.0900